SPECIAL WOOLEN NUMBER.

Volume XIII.
Number 4.

OCTOBER, 1897.

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The 1897 World's Complete Directory of Textile Establishments, the Mill Trade and of Large Buyers of Textile Fabrics is now ready for delivery. 360 pages, with 19 textile maps.

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GUILD & LORD, Publishers, 620 Atlantic Avenue, Boston, Mass.

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PROVIDENCE, R. I.

Bleaching, Dyeing, Drying and Finishing Machinery.

Cotton, Paper and Husk Rolls.

TENTERING MACHINES

With Patent Self-Feeding Clips.

Patent Combination Rolls

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Calenders, Mangles, Drying Machines, Tentering Machines, Hydraulic Presses, Etc.

BEETLES

Short and Long Chain Dyeing, Sizing and Drying Machines.

PATENT

OIL, COMBINED "PLATE and FLAME"

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H. W. Butterworth & Sons Co.,

PHILADELPHIA, - PA.

BLEACHING, PRINTING, DYEING AND FINISHING

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Tentering Machines

VIBRATORY

STRAIGHT

RETURN

— FOR ALL KINDS OF —

TEXTILE FABRICS.

Patent Automatic Clamp, Spring Clamp, Pin Chain.

SPECIAL.

Tentering Machines with Adjustable Eccentric for imparting vibrating motion. (Patented.)

The above gives a uniformly smooth motion and the finish obtained on goods is of a superior character.

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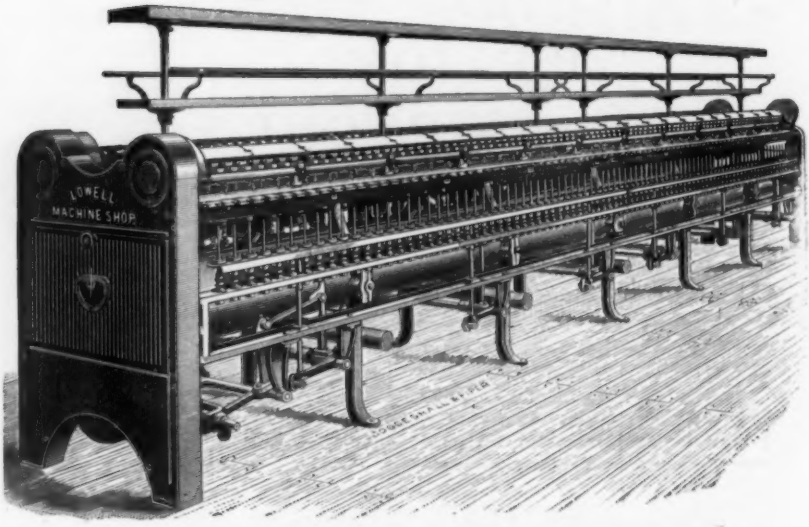
Builders of

Cotton Machinery

OF EVERY DESCRIPTION.



Revolving Flat Cards, Railway Heads,
Ring Spinning Frames, Fly Frames,
Drawing Frames, Spoolers, Warpers,
Slashers, Looms.

Complete Equipment for Cotton Mills.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.

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once made a remark
to the following effect:—

"THERE IS
nothing so bad but that
some fool will praise it, and
nothing so good but that
some fool will condemn it."

The Northrop Loom

Has now reached a stage where condemnation brings the latter end of our quotation to mind. : : : :

We have no fault to find on the whole, but we know of many instances where mills who cannot help but realize the advantages of our loom, still pursue the fatal policy of delay.

Hesitation in the face of facts is not only unwise but in the present case expensive. A mill buying these looms when we were first ready to take orders would have the extra cost well near annihilated by this time.

The following list shows a few of those who were prompt to decide:

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Revolving Flat Carding Engines,
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Wet and Dry Twisters,
Looms,

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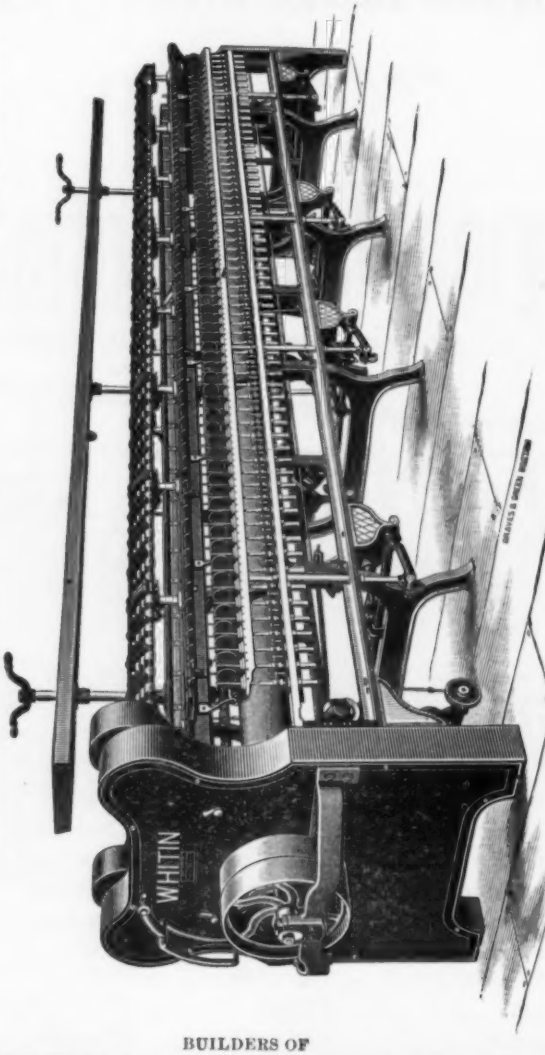

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BUILDERS OF

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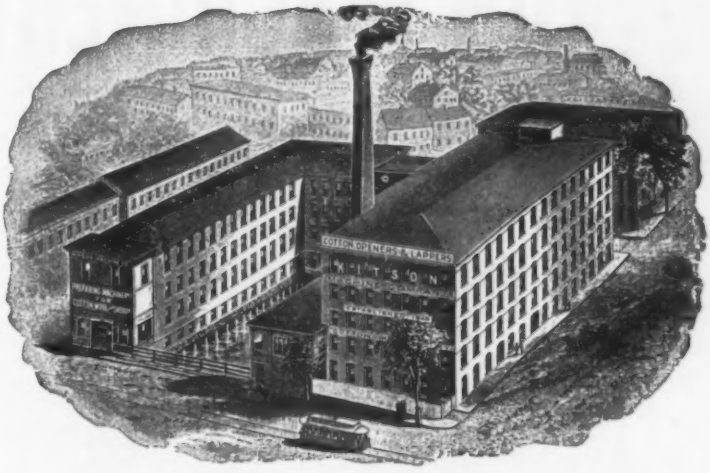

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MASON MACHINE WORKS,

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COTTON MACHINERY

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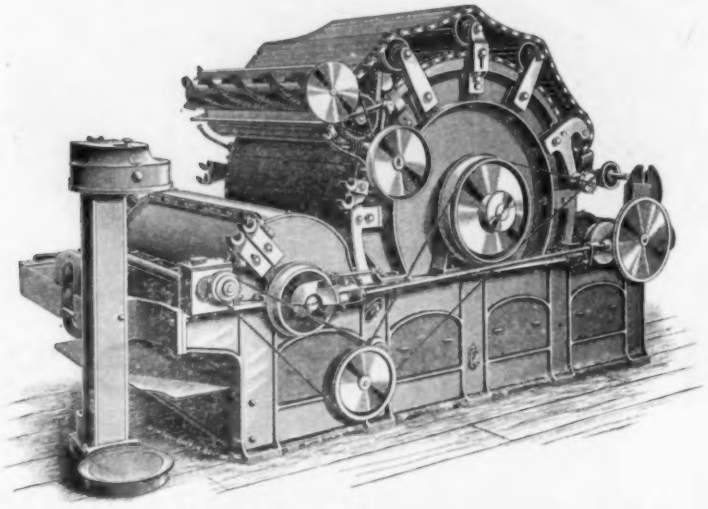
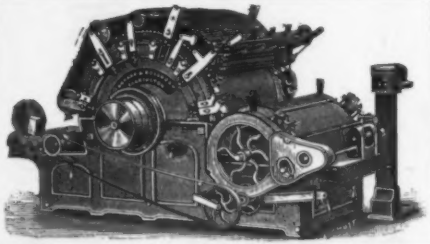


Cards, Railway Heads,
Drawing Frames,
Spinning Frames,
Mules and Looms.

The Celebrated FALL RIVER IRON WORKS CO., one of the largest cotton mill plants in the world, is entirely equipped with our spinning and weaving. It has 262,416 SPINDLES of our PATENT SPINNING FRAMES and 7,469 of our LOOMS.



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(LIMITED),

PAWTUCKET, - R. I.

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The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

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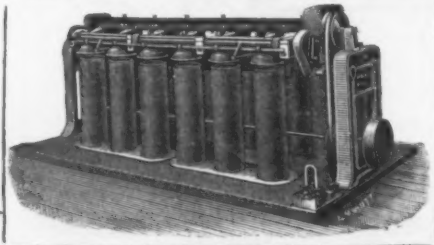
The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.



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Slubbing, Intermediate, and Roving Machines.

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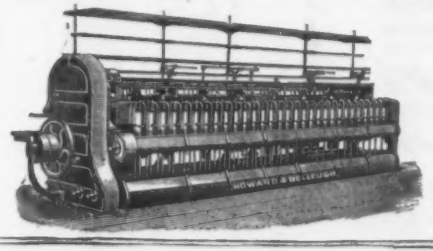

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Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

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Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

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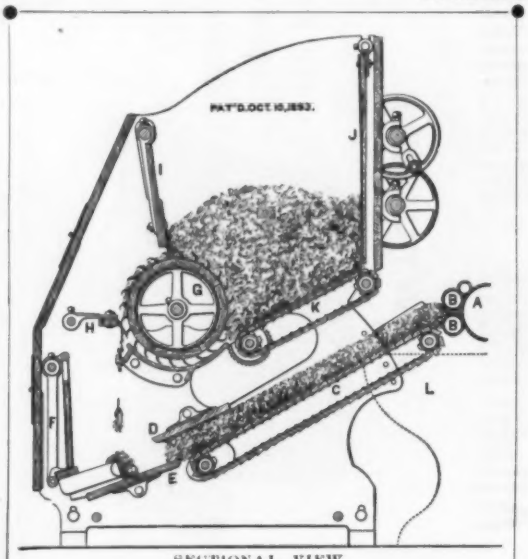
WOONSOCKET WORSTED MILLS,
EDWIN FARNELL. Agent.



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It is built in all sizes and guaranteed as represented.

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Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

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Woonsocket Machine and Press Co.,

GENTLEMEN—We have the pleasure to inform you that the two FISHER CARD FEEDS are working to our entire satisfaction, giving good results on both long and short wools.

Yours respectfully,
STAR WORSTED COMPANY,
(Second order.) A. GARTH, Supt.

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Loom Works,

Builders of every variety of

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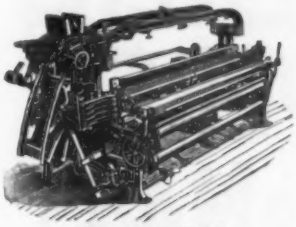

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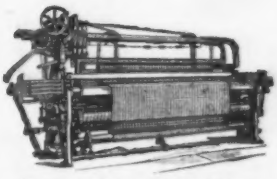
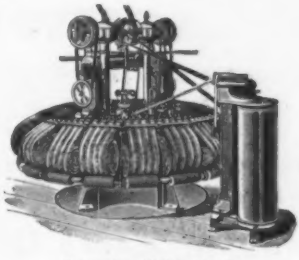


Knowles Heavy Worsted Loom.

Wool



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Crompton-Noble Comb.

For Combing

COARSE
MEDIUM
FINE

WOOLS.

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Makers of **LOOMS** for Plain and Fancy Weaving.

Also Shafting, Hangers, Pulleys and other appurtenances for the TRANSMISSION OF POWER.

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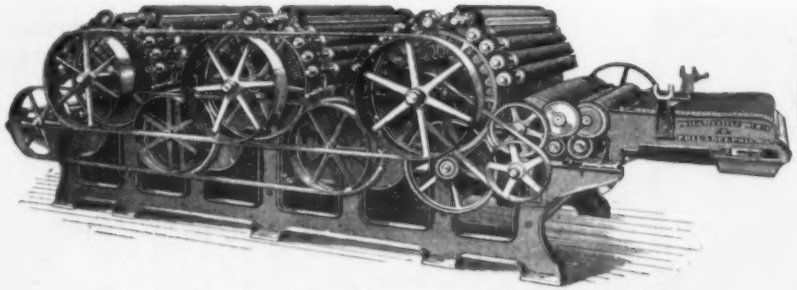

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For Hosiery, Underwear, Yarn, Cotton Stock and Wool. . . . . .

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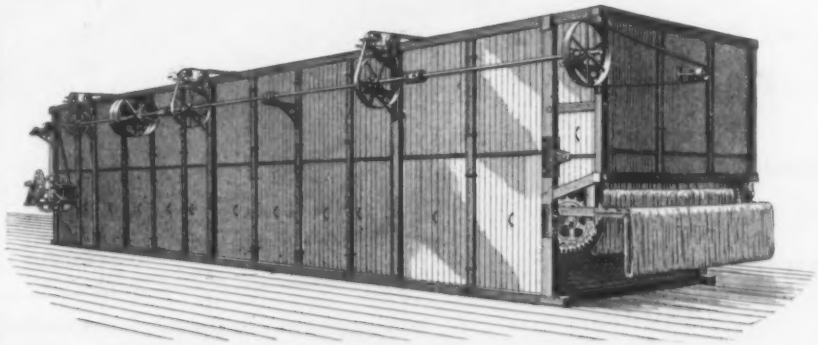

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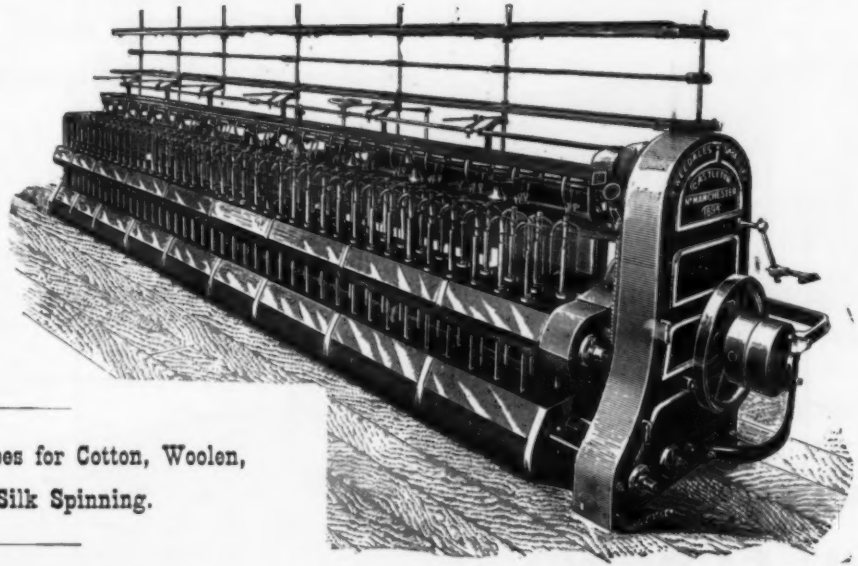

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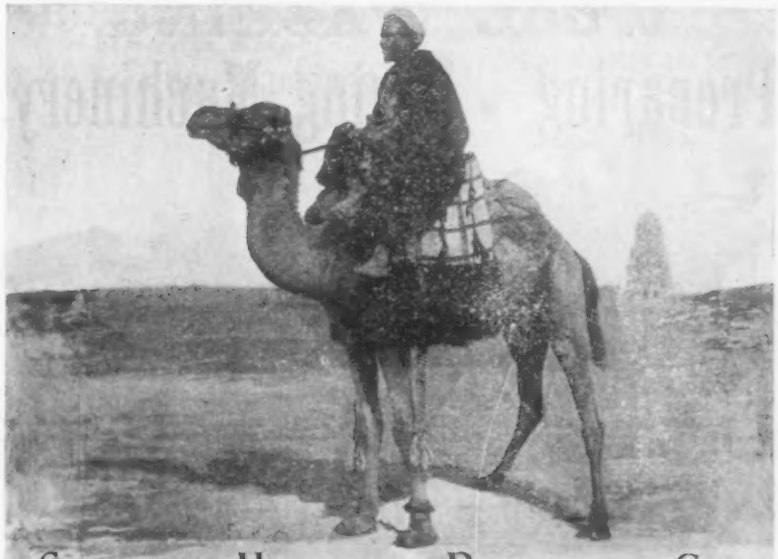

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REVOLVING FLAT CARDING ENGINES,
"1894" pattern with Patent Flexible Bend with slots for direct setting of the flats to the cylinder by the gauge, and McConnell & Higginson's Patent Grinding Apparatus for grinding the flats from their working surfaces.
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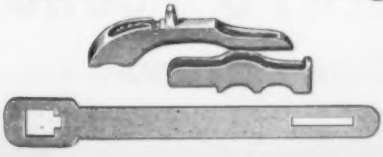

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.
The Stirrup is always in place.
No bent stirrup resting on rolls
Manufacturers of all kinds of Saddles, Stirrups and Levers. Send for Samples and Prices.
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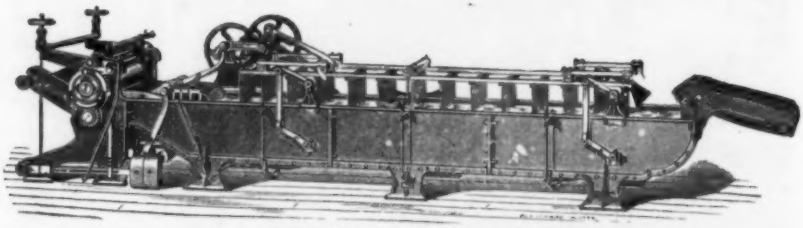

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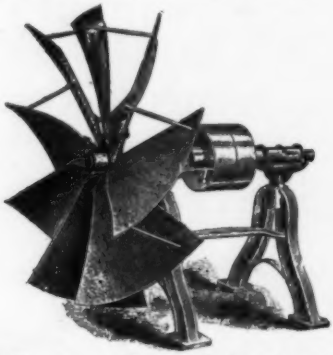

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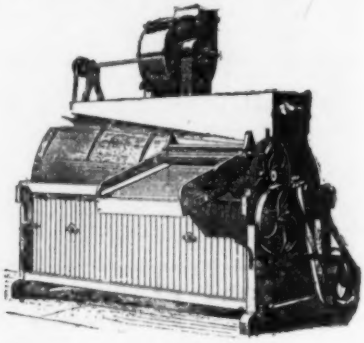
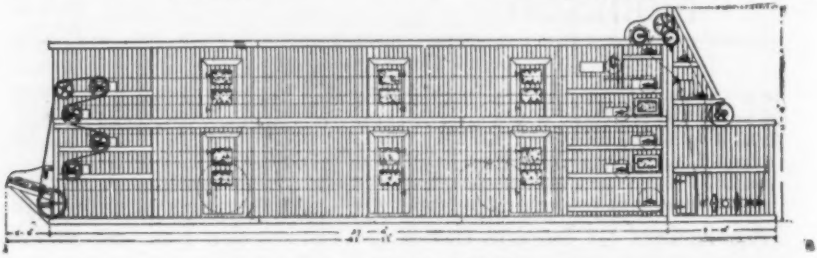


IMPROVED CONE DUSTER.
Exterior View Right-Hand Machine with Fan.



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Mill Sewing Machines.

Sews any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

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Special Machines for Cotton Mills, Woolen Mills, Print Works, Bleacheries, etc.
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These sticks are made from second growth North Carolina hickory, guaranteed straight-grained, clear and free from warp. There is no material to equal this for picker sticks—nothing so tough and durable. They cost more than ash, but those who use them say they last three or four times as long. We are selling thousands of these sticks and say without any qualification whatever, that they are the best sticks that have ever been offered. A sample to show quality, will be sent on application.

We also make Rawhide and Leather Loom Pickers, Loom Harnesses, Duck and Ticking Lug Straps, Tape Picker Loops, Picker Leather, etc.

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Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

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ESTABLISHED 1873.
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Manufacturers of Persian, Welsh and Calf **ROLLER SKINS.**

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Of Every Description.

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Fluted Rolls, Pressers for Flyers and General Machinery.

Specialties made of Renecking, Refluting, Filing and Honing all kinds of Rolls.

Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straighten R stepped and Retopped.

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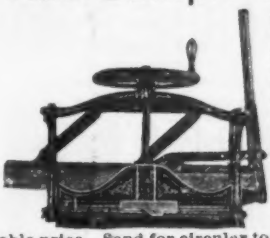

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Chemist for Sayles' Bleacheries, Faulkner, Page & Co. (5 Mills) And others.

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WIRE HEDDLES.
TEMPERED STEEL WIRE
STRIPPER CARDS.

ADDRESS L. S. WATSON MFG. CO., LEICESTER, MASS., FOR THE VERY BEST MADE

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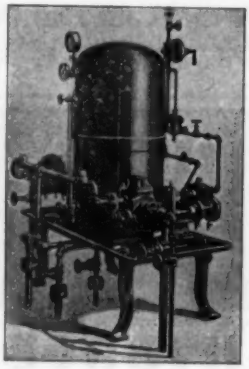

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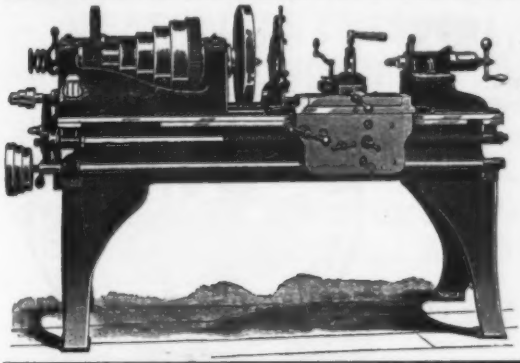

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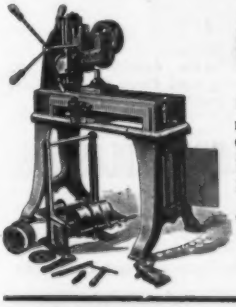

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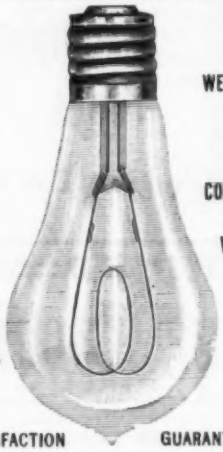

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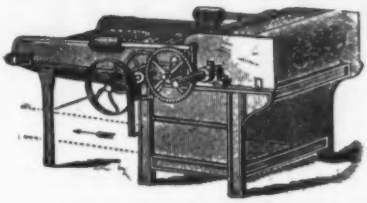

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Specifications and drawings furnished for ten cents each. Address W. S. Gavey, P. O Box 222, Brooklyn, N. Y.

Bales Method of and apparatus for compressing. 590,198. S. R Montgomery, Stonewall, Tenn.

Black Diazo Dye. 590,088. C. Bulow, Tubingen, Germany.

Bobbin Holder or Clamp. 589,690. G. T. Bowman, Philadelphia, Pa.

Cotton Baling Apparatus. 590,110. C. L. Melcher, Swiss Alp, Texas.

Cotton Chopper. 589,810. J. H. Bonner, Lockport, Tenn.

Cotton Chopper. 590,107. W. D. Latta, Holliday, Texas.

Cotton Seed De-linting Machine. 589,857. W. A. Ragsdale, Greenville, Miss.

Cloth Cutting Machine. 590,140. G. P. Eastman, Toronto, Can.

Cotton Picker. 590,090. D. S. Deaderick, Mammoth Spring, Ark.

Dye, red 589,766. J. Ville, Montpellier, France.

Ginning Machine Attachment. 589,339. N. R. Coursey, Blossom, Texas.

Knit Fabrics. Machine for uniting. 589,723. S. Henshall, Philadelphia, Pa.

Knitting Machine Fashioning Mechanism. 589,174. L. C. Huse, Laconia, N. H.

Knitting Machine Needle. 589,024. G. E. Philbrick, Manchester, N. H.

Loom. 589,913. W. Weaver, Norwalk, Ct.

Loom. 590,092. W. F. Draper and J. H. Northrop, Hopedale, Mass.

Loom. 590,112. J. H. Northrop, Hopedale, Mass.

Loom, circular. 590,122. R. Weiss, Nottingham, England.

Loom, circular. 590,123. R. Weiss, Nottingham, England.

Loom Let-off. 590,001. H. C. Cockerille, Lowell, Mass.

Loom Temple. 589,585. T. Sykes, Philadelphia, Pa.

Ramie. Machine for treating. 589,369. A. Price, St. Louis, Mo.

Spindle and Bolster. 590,037. W. H. Dunkerley, Paterson, N. J.

Spinning Frame. 589,176. J. C. Judge, Fall River, Mass.

Spinning Machine Yarn Separator 589,932. A. D. Chandler, Fall River, Mass.

Spinning Spindle Support and Driving mechanism. 589,994. S. L Wiegand, Philadelphia, Pa.

Spinning Spindle Support and Driving mechanism. 589,995. S. L. Wiegand, Philadelphia, Pa.

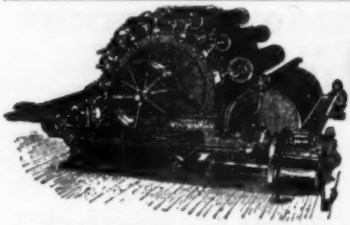
Warp Threads. Thread selecting device for machines for drawing in. 590,008. R. H. Ingersoll, Biddeford, Me.

—Lead is not much used as a mordant in dyeing or calico printing.

—No carpets are manufactured in Switzerland, although the sale of this article is increasing every year.

—A pictorial representation of the fulling process is still extant on an Egyptian tomb of the time of Osirtasen, the monarch supposed to be the Pharoah who invited the family of Joseph to settle down in his country.

—It may be safely said that, in a well managed mill, the waste incident to the preparation of gray warps from the cop, will vary from 1½ to 2½ per cent. of the weight of yarn purchased, but the latter ought not to be exceeded.



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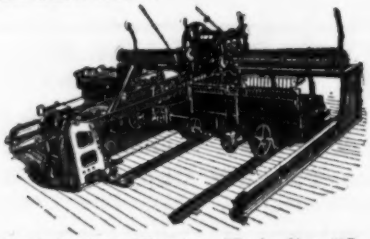

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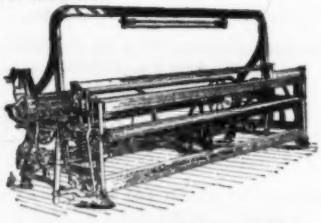


Blanket Loom No. 128.

—The cotton industry was established in Russia, as early as the 18th century.

—The Chinese cotton farmer sows cotton seed as the American wheat farmer sows wheat seed.

—In Japan, some mills are using American cotton exclusively in making the finer grades of yarn.

—By the term waste, is meant any portion of the material which cannot be used for the purpose intended.

—Thrift and perseverance win their way to higher stations in foreign countries, although they may be limited by conditions that do not exist here.

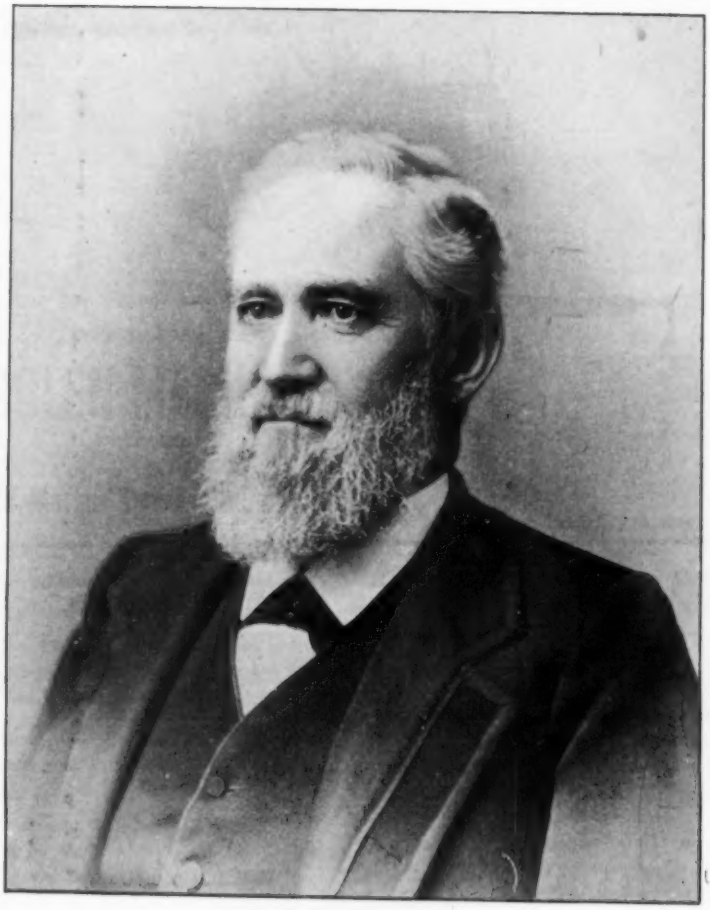
—Be sure that all openings for admission of air to boiler or flues, except through the fire, are carefully stopped. This is frequently an unsuspected cause of serious waste.

—In considering the problem of the development of trade relations among the countries of the American Continent, the question of improved transportation facilities is seen to be one of increasing importance.

—Japan varnish is a coating which is put on wood or metals, like paint, and is then hardened by stoving in a heated chamber, by which means the solvent of the varnish is partly evaporated and partly oxydized.

—At a very remote period there existed a high degree of civilization in Persia and India, and there are many reasons for believing that the arts of dyeing and printing have been practiced in India during a long succession of ages.

—Fuller's earth looks like a clay when found, but it has very different qualities. When thrown into water it immediately absorbs it, but breaks down into a fine pulp without being pasty. It is moderately heavy, compact, but friable, and unctuous to the touch.



ROBERT MIDDLETON.

TEXTILE WORLD.

Vol. XIII. OCTOBER, 1897. No. 4.

ROBERT MIDDLETON.

Robert Middleton was born in the city of Aberdeen, Scotland, May 17, 1825. His father emigrated with his family to this country in 1840, settling at Middle Granville, Washington Co., N. Y., where Robert, the third son in a family of eight children, obtained his education in the common schools of that place. At the age of eighteen, he went to Lowell, Mass., and engaged his services for six years in the Lowell Carpet Company. The succeeding seven years he spent with the Merrimac Woolen Co., acting as assistant superintendent of the company for six years. In this capacity he developed surprising capabilities in the management of woolen manufacturing, in which he afterwards gained both fame and fortune.

It was during the panic, May 10, 1857, that Robert Middleton was engaged to take charge of the Globe mill as agent and superintendent, inaugurating an era of prosperity seldom equalled. When Mr. Middleton first went to the Globe mills, it consisted of nine sets of machinery and employed two hundred hands, with a corresponding number of looms, as was usual at that day, when only woolen goods were made.

This institution had not been successful as a business enterprise until Mr. Middleton, with the energy and perserverance that have always characterized his career, successfully established a manufacturing industry which is at the present time famed far and near. From the first, Mr. Middleton assumed charge not only of the manufacturing operations of the mill, but also of its business operations, and has continued to direct them to the present. On the night of Sept. 6, 1871, a fire was discovered in the picking room a few minutes after eight o'clock, which spread with such rapidity that the mills were totally destroyed. Mr. Middleton, and others advised the immediate rebuilding of the mill, and work was begun without delay on what is now the woolen department of the Globe Woolen Company's mill. Before debris had cooled after the fire, gangs of men were employed in clearing the foundation for the new building. The new mill was built and furnished with the best machinery. It was started March 12, 1873, just sixteen months after the old mill had been laid in ruins by the fire, and the magnitude of the work accomplished in the intervening time will be appreciated by those who have seen the present building. After the mill was rebuilt, the first principles of positive success were inaugurated in selecting the very best machinery for the purpose to be had at that time, enabling the management to make the best goods placed upon the market in this country. Mr. Middleton is president and agent; E. T. Batsford, treasurer and secretary; Stanley H. Ray, selling agent; W. D. Middleton, superintendent.

The product of the Globe Woolen Mills was formerly sold by commission houses, but on the 1st of January, 1864, a salesroom of their own was established in New York City, now located at 329 Broadway. The entire product, amounting to $1,600,000 annually, is sold from there.

It was during the year 1885 that the Globe Woolen Co. decided to build a new worsted mill and make their own yarns, after many grievous disapointments with yarn made in other first-class mills, which did not come up to the high standard of merit demanded for the class of goods made by this company. With the object of securing the best machinery for this worsted mill. Mr. Middleton made a tour of England, Scotland and France, leaving New York, March 23, 1886. The result was a model worsted mill with latest improved machinery in every department, enabling them to produce 350,000 pounds of 2-ply best quality worsted yarn per annum. Today there are 31 sets of worsted and woolen card in all, and over 1500 employees on the pay-roll.

A series of large and massive buildings have been erected, in which to manufacture the cloth of the Globe Woolen Co. The product has a reputation for durability and finish second to none in this country; indeed, it is doubtful if any better cloth is made on the other side. The high compliment which the commissioners of the French government paid to the woolen goods manufactured by the Globe Co. at the Centennial at Philadelphia in 1876, comparing them with the best French goods, was well deserved, or they certainly would not have bestowed it. The recent addition to the worsted mill is the latest evidence of the prosperity and enterprise of this great establishment.

Such is the brief record of the active life of one of the foremost business men of Utica. Naturally of a retiring and reserved temperament, Robert Middleton has found his greatest pleasure in his home and among his intimate friends, and in the natural satisfaction which follows devotion to business, wherein he has found such unusual material success, while at the same time the characteristics and the habits thus formed drew him away from public life and prevented his acceptance of public station, which he might have had, and which he would have honored.

Labor in Germany.

The desire to reduce the length of the working day has produced more strikes in Germany than any other cause, except the desire to obtain higher wages. Working hours in Germany are, as a rule, very long, though they vary considerably in different places and in different industries. According to the Bavarian factory inspector, "in many factories the time of labor is not every year, nor even day by day, the same, but for different reasons, and on more or less urgent grounds, it is subject to manifold changes." From 11 to 12 hours actual work is required in many industries; in some the hours are still longer, and though the system of a ten-hours, and in some trades, such as printing, of a nine-hours day, is decidedly gaining ground, this advance has only been obtained by means of a large number of strikes. Between 1868 and 1878 a strong protest was made by the labor organizations against Sunday work, and in favor of the abolition of overtime. Sunday and night work is mentioned by the factory inspectors as one of the causes of strikes in 1889, 1890 and 1891. The cotton spinners of Linden, in Hanover, struck for an 11 hours day, which they obtained; directly this success had been achieved, they made a further demand for 10 hours, but were induced by the burgomaster to resume work. A reduction of working hours from 11 to 10 formed part of the demand of the Ravensburg cotton spinners, whilst the Lambrecht cloth weavers in the Palatinate and the textile workers in Alsace Lorraine desired an 11 hours' day in place of the 12 hours usually worked.

The influence of labor organizations upon strikes has been less marked in Germany than in many other countries, owing to the early failure of the trade unions in this respect, and the disabilities which from 1878 to 1890 attached to the Socialist organizations.

—By using fancy twist yarns at intervals, the style of design may be very much improved.

Textile World

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THE TEXTILE WORLD'S COMPLETE DIRECTORY OF THE TRADE.

(350 pages with 19 maps)

Containing full information about all

COTTON MILLS, WOOLEN MILLS, KNITTING MILLS, SILK MILLS, DYE WORKS, PRINT WORKS, BLEACHERIES,

also lists of

Dry Goods Commission Merchants,
Dealers in Raw Materials,
Manufacturing Clothiers,
Suit and Cloak Makers,
Jobbers and Large Retailers,
Buyers from First Hands.

Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

COTTON CROP 1896 97.

We give space, elsewhere in this issue, to an abstract of the annual review of the cotton crop for the past season, by the Commercial and Financial Chronicle, New York, which is considered one of the three leading authorities in this country concerning cotton statistics. The method of collecting and reporting statistics concerning the movements of the cotton crop may be subject to some criticism, but this we are not disposed to undertake, as probably any method that might be adopted would be exposed to more or less criticism. We will merely state, however, that in our opinion, the Chronicle is not careful enough in some of its tabulations in conveying accurate impressions. We refer particularly to its table giving, as stated, the crop of each State, when, in truth, the statistics refer solely to the shipments from the ports of the several States. We called the attention of the editor to this misleading table, and in his reply, he states that he does "not attempt to give the product of cotton by States in the annual cotton report, as considerable further investigation is needed to reach definite results. The apportionment to States is not usually compiled until the November investigation." The New Orleans Cotton Exchange, however, in its annual report, ventures to give the commercial crop by States, which we make use of, as below, in reference to the States of Georgia, No. Carolina, and So. Carolina, showing the commercial crop of these States, the consumption of mills therein, and the exports.

Our object at this time is to bring into comparison the statistics of the N. O. Cotton Exchange and those of the Chronicle, as tabulated below, showing certain differences between these two authorities, as in the commercial crop, of 43,943 bales. The most interesting part of these statistics relates to the Southern mills; the N. O. Cotton Exchange giving more mills, spindles and looms in operation than the Chronicle. We do not propose to pass judgment upon the relative reli-

ableness of these statistics. In explanation of the figures of the N. O. Cotton Exchange, the mills in operation include the old and new, the number of spindles being added to old mills, less spindles thrown out during the year.

	Crop, 1896-97. Bale.	Consumption. Bales.	Port Shipments.	Con-sumption. Percentage of Crop.	Southern Mills.				
					Commercial Crop. Bales.	Consumption Bales.		In Operation		Looms.
						North.	South.	Spindles.		
Georgia	1,300,000	226,717	632,830	17.4	8,757,054	1,894,689	1,042,671	414	3,419,063	91,137
South Carolina	800,000	327,643	270,228	4.59	8,714,011	1,835,000	1,024,462	375	3,197,545	82,873
North Carolina	300,000	258,923	206,794	51.8						
	2,600,000	813,283	1,109,852	31.3						
New Orleans Cotton Exchange										
Chronicle										

Regarding the Chronicle's figures, they are intended to represent mills in operation all the season, new mills started up during the course of the season, and also a few mills which have been in operation during the season that have stopped temporarily and expect to start up again during the current season. In further explanation of the Chronicle's statistics, we refer to the report elsewhere in this issue.

The average consumption per spindle by Southern mills for 1896-97, is given by the N. O. Exchange as 140.16 pounds.

MANUFACTURES OF HAIR.

The Board of U. S. General Appraisers rendered an important decision last August that is destined to be referred to frequently in subsequent decisions regarding the classification of manufactures of ox or cattle hair. Though this decision was made under the tariff act of 1894, it is equally as pertinent to the provisions of the act of 1897. In that decision it was the opinion of the appraisers that such manufactures came under the classification of a non-enumerated manufacture, and, therefore, subject to 20 per cent. ad valorem, under the act of 1894, and not subject to the duty imposed by the paragraph in the woolen schedule where the phrase appears "composed wholly or in part of wool, worsted, the hair of the camel, goat or alpaca, and other animals." The phrase "or other animals" is construed as embracing only other animals *ejusdem generis*, with the camel, goat or alpaca. We think that manufacturers and importers of hair manufactures would do well to bear this decision in mind.

PRICE OF COTTON.

As an evidence that the Northern mills are not at such a great disadvantage as many suppose, in the price that they are obliged to pay for their raw material over the price at which the Southern mills can obtain it, we have simply to refer to some of our North Carolina exchanges about the cotton centres, in which middlings are quoted at 6.6 cents to 6.75 cents per pound. At the time these prices were obtained in the local markets, Lowell manufacturers were offered cotton delivered at their mills from the Southwest, at the same price (6.75 cents), and in one instance, an offer was reported to have been made by a Boston buyer, at 6.50 cents per pound, and better staple. We mention this to substantiate what we have occasionally said in these columns, that the local demand in the manufacturing centres of the South Atlantic States is frequently so great as to raise the

price of cotton in such localities to a parity with the prices at which New England mills can obtain the staple delivered at their mills. We are not disposed to say, however, that the quotations that we observed in our North Carolina exchanges is a true criterion of the real difference between the local price there and the price paid by the New England mills. For though Gastonia, N. C., cotton, for instance, was quoted as 6.75 cents, and the same grade, but better staple, from the South-west was offered to Lowell manufacturers, delivered, at the same price, we are inclined to think that this quotation of 6.75 cents at Gastonia was the price that merchants there were willing to pay for the cotton, as an off-set to the debt owing them on account, from the planters; and as the price represented a trade operation, it might have been above a cash basis. Of this, however, we cannot say positively.

The price that is thus obtained for cotton by the planters and paid by the cotton manufacturer is of immense benefit to the former, though the latter may receive no particular advantage in the cost of his raw material over his Northern competitor. The planters mostly benefited are those in the immediate vicinity of the cotton factory. Therefore, to this extent, the cotton planters of the South Atlantic States are to be greatly felicitated for the gain that they derive from the establishment of manufacturing industries in their midst. Roughly speaking, we should say that for the last season the consumption of cotton by the factories in the Piedmont region has been worth to the cotton planters at least $1,500,000, they having obtained that much more for their crop than they otherwise would have received had they depended wholly upon an outside or foreign demand.

BALING COTTON.

Great complaint has been made in former years of the wretched method of baling the American cotton crop, but for all of the criticisms and protests that have been indulged in, no improvement has been accomplished. In fact, poorer bagging is used to-day than twenty years ago. No cotton in the world is so badly put up for transportation as that of the American crop. Renewed complaint has recently been made by the leading marine insurance companies, which intend to effect some improvement, if possible, by advancing the rates on cotton risks about 15 per cent. It has been found that reforms, heretofore, have been accomplished only by some method of this kind. It is evident to everyone that something should be done to force planters and others to a better baling and handling of cotton. What is known as country damage has been the cause of much dispute and claims from manufacturers. This damage occurs to a very great extent before the cotton reaches the ports of shipment, and is due to an exposure to rain, either in the field or on the platform at the railway depot, or to such carelessness as leaving or rolling the bale in mud. We have seen, time and time again, cotton thus exposed for days, for which there was no seeming excuse. It is high time for insurance companies, and, in fact, all others, to take this matter into serious consideration, and do something that will be remedial. There is no good reason why the American cotton should not be packed and cared for as scrupulously as the Egyptian or Indian cotton.

SHEEP IN MONTANA.

Notwithstanding the free importation of wool prior to the 1897 tariff act, there has been a rapid and material increase in the number of sheep in Montana, mostly merino. This is but a single example of the economic fact that sheep husbandry is a pioneer occupation in new countries, but little affected by tariff legislation, and which will decline for other certain economic reasons, as population increases with the accompanying pursuits of agriculture and manufacturing. The statistics concerning the

number of sheep in Montana, however, vary, though coming from assumed good authority. The Department of Agriculture, Washington, estimated the number of sheep in Montana, in January, 1897, at 3,122,732, while recent returns, as published in our Montana exchanges, to the State Board of Equalization, the number is given at 2,882,201. This State has more sheep than any other in the country, at an average value of $1.61 per head, according to the Department of Agriculture, and $1.72 a head, according to the State Board of Equalization.

THE SECRET OF SUCCESS.

Theo. C. Search, who is well known to our readers in connection with the Philadelphia Textile School, and as an earnest worker in behalf of technical education, called attention to certain things, in a recent lecture that he delivered, that the manufacturers of this country should heed. One of the things that Mr. Search dwelt upon was the "futility of attempting to exclude from the United States the finer products of foreign manufactures by the mere imposition of customs tariff duties, supposed to be prohibitory, without making provision for the training of such skilled help as will produce in this country goods of a character comparable with those which are sought abroad." This is not the first time that Mr. Search has alluded to this matter, for he very emphatically referred to it at an annual meeting, a few years ago, of the National Association of Wool Manufacturers. William Whitman, and others, have made similar statements before audiences of manufacturers, with manifest approval; and it is time that the manufacturers of this country should regard warnings of this kind and encourage in every way the establishment of institutions for technical training for our factories. The great success that German textile products have attained in recent years is wholly due to superiority in the skill of mill hands, derived from textile education. This is true, not only in the textile, but in the iron, and other lines of industry. England is thoroughly alive to German competition, due to advantages of this nature, and America should be also. If necessary, States, whose wealth depend upon manufactures, should appropriate funds toward the direct support of technical education. This is done abroad, to a great extent, and should be here.

KNIT GOODS.

That prices for knit goods are not high enough to give manufacturers a profit at the present price of wool, is altogether too patent to require any particular allusion to the fact. It is very doubtful if wool knitting manufacturers are getting out whole in the sale of their goods, based upon the present value of the raw material. Wool, within the last few months, has advanced 50 per cent. in value, and nothing like this advance has manifested itself in the sale of woolen underwear. So keenly is this state of affairs felt by manufacturers that they have attempted to improve it by some concerted action, in which an advance in price shall be demanded and maintained. This was the meaning of the recent meeting of knitting manufacturers in New York City, but it is rather doubtful if anything will be accomplished approaching what was aimed at. In order to effect changes in trade, beneficial or otherwise, to an industry, there must be a practical unanimity on the part of manufacturers, and the fact that there were a number of large knitters not present, or represented, at the meeting, would seem to indicate that very little may be anticipated only through the ordinary channels affecting the supply and demand for goods. If the demand is not large enough for the supply, a curtailment of the latter must be entered upon, which means a temporary stoppage of machinery. We think, however, that the conditions of trade will soon manifest themselves in a way to

dispose of all the knit goods that our mills can put out, and that an improvement will take place before many weeks.

One of those who were present at the New York meeting, touched upon a point that manufacturers should give more attention to, and that is diversification of styles and a greater reliance on meritorious production. There is altogether too much sameness in the manufacture of American knit goods. A diversification, of course, will add cost to the product, in the character of the machinery employed, the greater skill required of the operative, lessened production per machine, cost of designs, and occasional loss, possibly, from unpopular patterns, etc. As one of the speakers stated, there is seldom, if ever, witnessed a rising market travelling in a short time from extremely low to comparatively high prices, but the reverse, however, is frequently seen. If manufacturers are making any money on their woolen underwear, it is pretty certain that they are not taking their profit from their manufacture so much as from the advance in their raw material, which they may have bought some time ago at relatively low prices.

ENGLAND'S COMPETITORS.

The statistics of the exports of textile machinery from Great Britian to foreign countries, show a large trade in this line, amounting, in the course of the year, to fully $30,000,000, nearly $350,000 of which is going to establish factories in Japan, every month, as based upon the trade that has taken place during the eight months ending with last August. Competition in manufacture is thus promoted, which the factories of Lancashire, England, are keenly alive to. The fact of this competition is observed at the present time in the depression that exists in the Lancashire district, and especially in the mills devoted to the production of coarse fabrics. Cotton manufacturing in England to-day is very unsatisfactory. This is noted about Burnley, where out of some 54,000 looms, over 8000 are reported as stopped, due to a lack of demand for goods. Such a condition of things is said to have been never before known. In order to keep the weavers employed, in many cases, six-loom weavers have been put on to four looms, and four-loom weavers on to three, and so on, so that while only a few operatives have been thrown out of employment altogether, their weekly earnings have been seriously diminished.

TARIFF ENIGMAS.

The Treasury Department is already importuned for opinions upon several questions relating to the wool schedule of the tariff, among which may be mentioned the so-called "sorting, or skirted wool clause," and common goat's hair. The representatives of the wool growers are trying to have the interpretation of the tariff so made as to exclude skirted wools other than those imported from Australia, relying upon that part of the tariff which refers to the importation of wools prior to 1890. This contention is easily disposed of, we think, by reference to the Treasury Department's opinion addressed to William Lawrence, July 1, 1891, which explicitly states that such wools apply to those obtained from Cape of Good Hope, Buenos Ayres, Montevideo, etc.

A more important question, however, is the classification of common goat's hair. The Boston custom house has written to the Department for instructions in regard to this kind of hair under the present tariff. The solicited instructions have not yet been received. We do not desire at this moment to discuss this question, but we expressed an opinion in our August issue that this hair was non-dutiable, but that manufactures from it were dutiable. That common goat's hair was intended to be on the free list seems to be clearly expressed in the changes that were made in the Dingley bill by the Senate finance committee. The House bill imposed a

duty on common goat's hair, by name, which the Senate eliminated, and this amendment was confirmed by the conference committee, agreed to by both houses, and was approved by the President in that shape, which shows pretty conclusively that Congress intended that this commodity should go on the free list. Under the 1890 act, there were three decisions of the general appraisers concerning common goat's hair, to the effect that it was dutiable. The question was carried into the courts to the supreme tribunal, which affirmed the decisions of the appraisers, making it dutiable. Under the 1883 act, this hair was free, if unfit for combing purposes.

TEXTILE EDUCATION IN THE SOUTH.

D. A. Tompkins, of Charlotte, N. C., is a man that is rightfully regarded as being possessed with a considerable amount of common sense, and this is no better illustrated than in a recent letter of his addressed to the chairman of the board of trustees of Clemson College, South Carolina, regarding the advisability and practicability of establishing a textile school in that section. We allude especially to his suggestion that if an educational system is applicable and successful in one section, an imitation of that system is not always the best, or even suitable for another section. This is well worth bearing in mind in regard to the present agitation now almost exclusively confined to Southern newspapers, for the establishment of textile education in the Southern manufacturing districts. Textile tuition pertaining to the manufacturing of woolens would be entirely out of place, at this time, in the South. Such tuition should be confined to the manufacture of cotton. It is not such an easy thing as many appear to think to secure proper instructors for schools of this kind, as an important requisition is that the instructor shall possess the power to excite and hold the student to a keen interest in his studies. Simply a well informed man in the subjects that may be taught would prove a failure, unless he possessed the characteristics just named. We still think that under present conditions, classes or night schools in large manufacturing centres are the thing.

IMPROVEMENT IN TRADE.

We have but to refer to our industrial news columns to show the improvements in trade in the several branches of the textile industry. The present tariff is having a tendency of making foreign capital seek investments in this country in the establishment of factories, and though these will come in competition to those already existing, still the capital involved will add so much to the wealth of the country, though much of the profits arising from its use will go abroad. This we note, especially, in the projected establishment of silk mills by capital from England, France and Switzerland.

—Attorney General McKenna's opinion regarding the proper interpretation of section 22 of the new tariff act concerning the discriminating duty on imports in foreign vessels, should prove highly satisfactory to the commercial interests of this country; but the attorney general had to do some close turning of corners in order to arrive at the interpretation that he has. No doubt the opinion that he has rendered conforms to the sentiment of Congress, but this is contrary, as we view it, to the intent of those who secured the passage of the section as it now stands, and that the elimination of the phrase "by an act of Congress," which has been an important feature in similar sections in former acts, was done with a purpose opposed to the attorney general's opinion. It now appears, in a recent report from the United States consul at Bordeaux, that the French government has for years practiced, without protest from foreign nations, a system of discrimination in the levying of import taxes that correspond very

closely with the meaning supposed to have been embodied in section 22.

—We have a report that the State of South Carolina has sold its interest in the water power at Catawba Falls, and has deeded it to the party owning the surrounding property, in order that it may be sold to a syndicate of capitalists, who intend to develop the power electrically, for the operation of a cotton factory of considerable size. We have in our possession a copy of the civil engineer's report concerning this power, showing it to be a water power capable of running a large number of spindles, and one of the finest in the State. The advance that has been made in the transmission of power by electricity enables the utilization of this power, which has been idle for a number of years.

—The price of silver in the London market, the latter part of August, was 24¾d. per ounce, against 31⅜d. the year previous. This shows a tremendous decline. The biggest drop in the price of silver was during the month of August. The price in Manchester, England, of 8¼ pound shirtings was 60d. per piece, the latter part of last August, against 67½d. at the same time the previous year. The price of cotton yarn in Manchester, England, dropped, in the course of the twelve months ending with August, 1897, from 6 9-16 to 6 5-16d. for 40's weft.

—The effect of the tariff on importations of wool is noted in the record for August, showing that at the ports of New York, Philadelphia and Boston for that month, only 2,875,897 pounds were imported. The larger portion of the importations consisted of class three, or carpet, wools. This seems to be a small amount when compared with the importations last April, when they reached 97,629,294 pounds.

—The exact time when the new tariff went into effect is now pending before the Board of U. S. General Appraisers, in the cases that have recently been presented to the Board for a decision. It will be several weeks before an opinion will be rendered, and what it will be, of course, is unknown.

Tariff on Wool and Woolens.

The chapter on the textile schedules of the tariff of 1897, particularly the one relating to wool and woolens, that appears in the September issue of the Bulletin of the National Association of Wool Manufacturers, by Secretary North, is something that our readers are deeply interested in, and should be carefully perused by them, so that they may come to a full appreciation of the position of the organization which represents their interests. The chapter is particularly valuable, as it comes from an undoubted authority, familiar with the causes and events that led up to the construction and enactment of the present tariff law. The statements that appear therein are clearly put, and their meaning cannot be mistaken. Mr. North states one truism that the business community and our legislators ought to bear in mind, and that is that "the business of any country can adapt itself to any tariff, but it cannot stand the killing necessity of fitting itself to new tariff conditions every few years. The tariff is not a political, but a business question." So true is this, that, in Mr. North's opinion, "it is doubtful if any great political party will care or dare to accept the responsibility of uprooting the business basis of the country by this wholesale method of tariff revision; and the lesson which all parties and politicians must draw from the repeated tariff convulsions of these seven years is, that revision must hereafter be done in moderation, step by step and industry by industry." The discussion of the tariff in Congress has made it clear that the protective sentiment is steadily growing stronger in the country, as a whole, and though the views of New England and the Middle States are drifting in the direction of more moderate duties, it is strikingly true that the great West, and also the South, are becoming more and more attached to the protective doctrine than at any previous period in our history. A distinguishing feature of the Dingley tariff is its especial care for agricul-

tural products, and the impress it gives that free raw materials are not likely to figure to any extent in our tariff measures for sometime to come. The sentiments of the Democratic party in the South, which heretofore have been associated with free raw material, have been turned more to their protection, as illustrated in the efforts to place a duty on cotton.

Mr. North says that "the wool manufacturers in this revision of the tariff have asked less protection from Congress, in comparison with the rates of the Act of 1890, than any other textile industry; and in comparison with the other branches, they have received less than any other, in the way of advances over previous rates." This statement is made in no complaining spirit, for, on the contrary, manufacturers have no fault to find with the consideration shown them. Mr. North gives in his article a little inside history relating to the wool and woolen schedule, and states that "from the beginning of the work, the wool manufacturers have made no concealment of the fact that they strongly deprecate a return to the high duties of the McKinley Act upon their raw material. They pointed out to Congress, in the original statement before the Ways and Means Committee, and in their subsequent statement, that the return to these high duties must have the effect to restrict consumption, in view of the low price for woolens which have latterly prevailed, and the rapid advance in the use of other and cheaper fibres as substitutes for wool. They pointed out, also, that by reason of access to foreign wools, our manufacture has diversified in many directions that require the use of foreign wools, and a tariff which denied access to them, or unduly restricted access to them, would limit and hamper the further development of the industry. But influences were powerful at Washington against which the wool manufacturers early recognized the uselessness of contention. Both in the House and in the Senate, the majority of the majority was controlled by representatives who distinctly sympathized with the claim of the wool grower that under high duties the American farmer can and will grow all the wool, of whatever variety, needed by the American manufacturer. No demonstration to the contrary availed against his dictum, disproved as it is by the experience of half a century. The rates of duty on wool contained in the new law were necessary to the enactment of any law. That is the central fact to be borne in mind, in any consideration of the justice or the expediency of these rates."

The wool growers have apparently no reason to complain of the action of the wool manufacturers in their failure to receive in the new tariff the prohibitory protection which they demanded, but rather they must attribute their failure in obtaining the extreme rates that they asked for to the strong public sentiment against the imposition of such rates.

An important modification has been introduced into the wool classification, by no longer confining it strictly to the question of blood, but to some extent to the question of use, which was particularly avoided in all of the previous tariffs, from 1867 down to that of 1890, inclusive. Examples of this change are noted in the transfer to class 1 wools of some that have heretofore found their proper classification with class 3 wools. From a scientific point of view, Mr. North looks upon this change as one greatly to be regretted.

The wool schedule is very different from that which the wool growers demanded, and very different from what the wool manufacturers desired, "though the schedule (relating to woolens) is a decided improvement over that of the McKinley tariff act, in that it has fewer dividing lines in the compensatory duties, and but one dividing line in the ad valorem duties."

—In American sheep husbandry of the future meat production is undoubtedly to be the leading consideration.

A Cotton Harvester.

It is stated that there are 1100 models of cotton harvesting machines at the United States Patent Office, sent there within the last 25 years, and not one has ever been successful; still, these inventions are going on, and we hear of one or more each season. A new invention was exhibited quite recently in the neighborhood of Houston, Tex., before a number of persons, who are reported as testifying that the machine came nearer to taking the place of human fingers than anything of the kind ever before made. The inventor of the machine is George S. Lee, Hawthorne, N. J., who, it appears, has experimented with it several times recently in the neighborhood of New York, but decided that a thorough test in an actual cotton field was needed, and Texas was selected as the place of trial.

The machine is about thirty inches wide and six feet in length. It is intended to be pulled by a mule or large horse, and goes between the rows of cotton. Extending from each side and behind are long rubber arms in the form of hose, which are used to draw out the cotton. The harvester is run by gasoline, and suction is generated by an exhaust fan to take the cotton from the bolls. Each arm of hose is handled by one person, who merely applies the suction pipe to the opened boll of cotton—and the machine does the rest. One harvester can have anywhere from eight to twenty-one arms, and will employ just that many men. Each hose, according to the inventor's statement, can pull out at least 1000 pounds of cotton a day, consequently, a machine with fourteen arms would do the work of seventy men, estimating the average picking by hand at 200 pounds daily.

As the cotton is drawn through the pipes it passes the exhaust fan and falls into a large wire receptacle, each seed, and the lint surrounding it, dropping out together. The suction takes in very little trash, and when handled properly, nothing but the cotton itself would ever leave the stalk. The great disadvantage of all cotton picking machines heretofore invented has been their inability to gather the cotton without taking in part of the boll, dead leaves, trash, etc., which naturally made the cotton dirty and of low grade when ginned.

Mr. Lee's machine is not regarded as perfect, by any means, but those who observed its working say that it demonstrates the feasibility of gathering cotton by suction. Like all inventors, Mr. Lee is sanguine, and feels that if the theory upon which his invention is based is correct, it will simply require him to improve and develop its mechanical details. We learn that Mr. Lee has used this same machine for cleaning the streets of New York, the trash being drawn up by a similar method of suction.

Recent Sales of Mill Shares.

	Lowest.	Highest.
Androscoggin	113	114½
Bates	113½	114½
Cocheco	200	200
Lancaster	325	325
Lyman	68¾	69
Massachusetts	94¼	94¼
Naumkeag	56¾	62¼
Nashua	510	510
Border City	120	125
King Philip	98½	100
Merchants	105	110
Sanford Spinning	90	90
Shove	107½	112½
Davol	102¼	103
Osborn	112½	112½
Weetamoe	62½	62½
Wampanoag	110	110
Barnard	90	97½
Cornell	113	113
Laurel Lake	93	93
Amory	143	145¼
Appleton	475	475
Boott	1065	1075
Continental	18	19
Franklin	102¾	102¾
American Linen	102½	102½
Seaconnet	110	110..
Atlantic	63½	63½

—We referred in our last month's issue to a bullet proof cloth that had been exhibited at different points in this country, but which we learn from the Chief of Ordnance in the United States army, that it has not been presented to the Ordnance Department for testing. We learn from this source that the fabric was tested at Fort Sheriden, near Chicago, in the presence of army officers, who found the material difficult to penetrate, but too heavy for practical use in the military service. Detailed reports concerning the fabric, however, are wanting.

Cotton Crop of 1896-97.

The Commercial & Financial Chronicle's annual cotton-crop report was issued in due season last month, from which we make the following abstract: The total crop for the last year was 8,714,011 bales, while the exports were 5,968,422 bales, and the spinners' takings were 2,887,047 bales, leaving a stock on hand at the close of the year of 77,015 bales. The following is the crop statement of the Chronicle for the last three seasons:

	Bales		
Year ending Sept. 1.	1896-97.	1895-96.	1894-95.
Receipts at the shipping ports.....	6,816,525	5,394,875	7,882,163
Add shipments from Tennessee, &c., direct to manufacturers	873,004	851,788	1,157,251
Total	7,689,529	6,246,663	9,039,414
Manufactured South not included above	1,024 482	915,810	853,352
Total cotton crop for the year.....	8,714,011	7,162,473	9,802,766

The season of 1896-97 has throughout been disappointing. Few, if any, encouraging features in the cotton manufacturing industry of the United States can be mentioned. Sanguine expectations have abounded, but the surroundings have proved so adverse that each glimmer of apparent promise has soon vanished and hope been deferred. The financial returns of the mills for the twelve months closing with August 31, 1897, have consequently been very far from satisfactory.

Without attempting to follow the course of the market more in detail, the following is given, which shows at a glance the relative position of the raw material, printing cloths and other standard goods.

	Low Middling Upland.	Standard Sheetings.	Lancaster Ginghams.	Printing Cloths 64x64.	Low Middling Upland.	Standard Sheetings.	Lancaster Ginghams.	Printing Cloths 64x61.
	1896				1895			
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Sept. 1....	7 1/16	5 1/8	5	2.50	7 3/4	6	5	3.06
	1897				1896			
Jan. 1....	6 3/4	5 1/2	5	2.50	7 1/16	5 3/8	5 1/4	3.00
Apr. 1....	6 1/16	5 1/2	4 1/2	2.56	7 1/8	5 1/2	5	2.70
July 1....	7 1/8	4 3/4	4 1/2	2.50	7 1/16	5 1/2	4 1/4	2.44
Sept. 1....	7 1/16	4 3/4	5	2.62	7 1/16	5 1/8	5	2.50

The conditions of the cotton goods industry the world over have served to prevent any considerable rise in value, notwithstanding the fact that the world's available supply has for some little time past been much lower than in any season since 1890; and indeed, even lower comparatively than then, that is, if due allowance be made for the important increase in consumption since 1890. Belief in higher prices was somewhat encouraged by the rise in September last, but the upward turn was only temporary, prices gradually receding until 6 11-16 cents for low middling cotton was touched in December.

Southern manufacturers, although affected in less degree by prevailing adverse conditions than Northern mills have nevertheless suffered. Speaking generally, the mills have been quite fully operated during the season, and consumptive capacity has been increased by the starting up of a number of new establishements; but the profit has been less heretofore, and on many lines of goods no profit has been the complaint. Some classes of heavy colored cottons have especially been in over supply, and in an effort to reduce accumulated stocks, the mills running on them have latterly been working on short time; the inability also to obtain a supply of the raw material on terms that would enable the mills to make goods at ruling prices has forced other managers to stop operations partially or wholly.

As was to be expected, there has been a further extension of spinning capacity at the South this year. When we consider the amount of territory covered, the natural advantages enjoyed, and the further fact that, while cotton manufacture in the South has made rapid advances in late years, the aggregate number of spindles in operation is barely as great as in the city of Fall River, there is good reason to believe that for some time to come our annual report of spindles will show a gain over its predecessor. In pursuance of the plan so successfully followed by us for over a decade, we have gathered this year as full infor-

mation as is obtainable bearing upon the operations and development of Southern factories. Within the past month not only have we procured from each mill returns as to actual consumption of cotton in bales and pounds, and number of spindles and looms added, working and idle, the past year, but have also secured considerable data with regard to new mills now building, and contemplated additions to existing plants. The returns made to us, as in former years, have been extremely prompt and complete, so that we can to-day give the actual condition in these particulars of almost every factory in the South. The aggregates of our detailed returns arranged by States are as follows. (It should be remembered that these figures include (1) mills in operation all this year; (2) new mills started up during the course of the year, and (3) also a few mills which have been in operation this year, but have stopped temporarily and expect to start up again in 1897-98).

States.	No. of Mills.	Spindles	Consumpt'n Pounds.
Virginia	11	133,497	17,277,516
North Carolina	147	852,221	123,059,275
South Carolina	64	994,740	148,767,042
Georgia	67	677,825	108,167,531
Florida	...	.....	.....
Alabama	32	212,088	34,182,672
Mississippi	8	70,882	9,119,867
Louisiana	3	58,952	7,417,021
Texas	4	29,160	6,183,276
Arkansas	1	3,000	325,197
Tennessee	26	95,836	14,203,122
Missouri	3	11,752	1,511,905
Kentucky	9	57,592	10,756,911
Total, 1896-97	375	3,197,545	480,971,335
Total, 1895-96	352	2,770,284	430,543,330
Total, 1894-95	322	2,379,281	401,706,255
Total, 1893-94	321	2,167,242	335,569,957
Total, 1892-93	314	2,082,197	339,650,657
Total, 1891-92	293	1,938,524	315,903,286
Cens. total 1879-80	164	561,360	87,610,889

The returns for the last six years include, as heretofore, only the spindles in operation and those shortly to start up again. In a subsequent table for the whole country we include those idle for a year or more, omitting only those that are old and useless and permanently out of employ. It further appears from the returns made to us that there have been 10 old mills running 27,824 spindles stopped, and 33 new mills running 188,446 spindles started, making a net addition of 23 new mills running 160,622 spindles during the year. Moreover, the total new spindles added this year is 427,261 net, showing that 266,639 of these spindles have been an increase in the spinning capacity of old mills.

There is another branch of the cotton goods industry which claims attention. We refer to the export movement, which this year has shown a further and decided expansion.

Exports of Cotton Manufactures.	—Year ending June 30— 1897.	1896.	1895.
Colored goods, yards	83,409,441	58,747,729	58,467,743
do value.	$ 4,770,221	$ 3,419,158	$3,444,539
Uncol'd goods, yards	230,123,603	166,391,639	125,790,318
do value.	$12,511,389	$9,539,199	$7,034,678
Other manuf's of value	$3,756,058	$3,879,039	$3,310,593
Total cotton manufactures exported value,	$21,037,668	$16,837,396	$13,789,810

As to the number of spindles in the United States, there is but little to be said. An appreciable amount of machinery was idle August 1, 1897, mainly in the North; but the stoppage was only temporary, and has been largely started up since then. The aggregate net increase in spindles at the North has been moderate this year, reaching about 100,000 spindles. At the South, according to our returns, through new mills and additions to old factories, there has been a gain of 445,341 spindles. With this year's changes, the number of spindles in the whole country, at the close of 1896-97, and of the previous five years, would be as stated in the subjoined table.

(It should be said in explanation of our compilation of total spindles, that this statement represents all mills, whether in operation or not (except such as have been closed with no present intention of starting up again), whereas the details of Southern Mills by States given previously, represent only mills in operation in some portion of 1896-97, or about to start up):

Spindles	1896-97.	1895-96.	1894-95.	1893-94.
North	13,900,000	13,800,000	13,700,000	13,550,000
South	3,456,537	3,011,196	2,433,248	2,291,064
Total,	17,356,537	16,811,196	16,133,248	15,841,064

American spinners close the year with moderate stocks of cotton. The takings through the year of Northern

and Southern spinners have been given as below:

Total crop of the United States, as before stated.....bales,		8,714,011
Stock on hand commencement of year, (Sept. 1, 1896,)		226,734
Total supply during the year ending Sept. 1, 1897.....		8,940,745
Of this supply there has been exported to foreign ports during the year	5,968,422	
Less foreign cotton included, bales	77,511—5,890,911	
Sent to Canada dir't from West.....	76,848	
Burnt North and South....	5,135	
Stock on hand end of year Sept. 1, 1897	80,004 —	6,053,698
Total takings by spinners in the U.S. for year ending Sept. 1, 1897.....		2,887,047
Taken by Southern spinners (included in above total).....		1,024,482
Total taken by Northern spinners..		1,862,565

Our summary of takings and consumption reaches the following results:

Takings and Consumption.	1894-95.	1895-96.	1896-97.
Taken by—	Bales.	Bales.	Bales.
Northern mills..	2,154,170	1,670,744	1,862,565
Southern mills..	853,352	915,810	1,024,482
Total tak'gs from crop	3,007,522	2,586,554	2,887,047
Stock held by mills	47,217	161,387	52,131
T'l year's supply	3,054,739	2,747,941	2,939,178
Consumption (estimated)—			
Northern mills..	2,040,000	1,780,000	1,855,000
Southern mills..	853,352	915,810	1,024,482
T'l consumption	2,893,352	2,695,810	2,859,482
T'l supply as above	3,054,739	2,747,941	2,939,178
Leaving mill stocks Sept. 1	161,387	52,131	79,695

We cannot speak as positively of the situation at this point in the season as we are sometimes able to do. The chief reason for lack of facts on which to base a judgment is the backwardness of the plant. Compared with 1896, the growing crop is a late one, and consequently more dependent upon future developments and conditions than an early crop. Then again, our acreage report showed that the start in the spring, as a rule, was backward, and otherwise not favorable, though Texas was an exception. Hitherto these early defects have not disclosed weaknesses, the conditions of growth in June, July, and over a large section in August, having been less trying than usual, so that the plant has nowhere met with any real disaster. At the same time, the late feature is just as it was in the spring, having in no degree been made good. In Texas, the dry weather which prevailed over a large part of the State from early in July until after the middle of August, caused apprehensions of serious injury, but since rains have fallen, the outlook is improved. We hardly need to say, that with these drawbacks it would be very venturesome to give any forecast of the yield. No crop ever depended to a larger extent than this upon future developments and weather conditions.

The Power Loom.

More or less has recently been written for the Boston press, and extensively copied by the press throughout the country, relating to the early weaving in this country by the power loom. In connection with this, we feel as though our readers would appreciate the following communication to the editor of the Boston Transcript, from Nathan Appleton, whose father's name has been closely associated with the first efforts made in the weaving of fabrics by power. The first power loom was started in the cotton mill at Waltham, Mass., in 1814. The first mill in America to spin and weave cotton into cloth, under one roof, was that of the Boston Manufacturing Co, at Waltham. Nathan Appleton writes as follows:

"In the pamphlet written by Nathan Appleton, and published in 1858, entitled 'Introduction of the Power Loom and Origin of Lowell,' my father has given a good account of the history of this new industry. He met Mr. Francis C. Lowell in Edinburgh in 1811, and Mr. Lowell informed him before his return to America he intended visiting Manchester for the purpose of obtaining all possible information in relation to the power loom, with a view of introducing it into the United States. My father encouraged him to do so, and promised his co-operation.

"Mr. Lowell returned to Boston in 1813, and with Patrick T. Jackson, determined to establish a cotton man-

ufactory, and purchased a water power in Waltham (Bemis Paper Mill), and obtained an act of incorporation. Nathan Appleton joined them, and with the services of the skilled mechanic, Paul Moody, of Amesbury, grand-uncle of the present member of Congress from the Essex district, they soon had everything ready for practical results. After the first experiments had been satisfactorily accomplished, Mr. Lowell asked my father to go with him to Waltham and see the loom operate. The latter says: 'I well recollect the state of admiration and satisfaction with which we sat by the hour, watching the beautiful movement of this new and wonderful machine, destined, as it evidently was, to change the character of all textile industry. This was in the autumn of 1814.'

"The start thus made soon became so successful that its promoters, with others, sought new fields and a greater water power, and selected the falls of the Merrimac, in the old town of Chelmsford. In November, 1824, it was voted to petition the Legislature to set off a part of Chelmsford, as a separate township, and it was my father who said it ought to be called Lowell, in honor of the man who had died some years before, and who was, as he expressed it, 'the informing soul which gave direction and form to the whole proceeding.'

"The writer of this, whose father had been president of the Merrimack Manufacturing Company for more than twenty years before his death in 1861, visited Lowell more than a year and a half ago, the guest of Joseph S. Ludlam, since dead, at that time agent of the company. As he looked at the marvels of modern machinery in the mills, and the beautiful textile fabrics they produced, nothing gave him more pleasure than the sight of some of the old power looms which seemed to be about the same as those used in Waltham in 1814."

Another letter to the Transcipt, called forth by the discussion as to which was the first mill to manufacture cotton cloth in the United States, contains the following information, as an extract from the journal of Hon. George H. Kuhn, for fifty years a prominent manufacturer. In giving an account of the convention of manufacturers of woolens, which began its sessions in New York, May 18, 1831, and which Mr. Kuhn attended, he wrote: "S. N. Decker told us that his father was the first manufacturer of cotton cloth in the United States, at Providence, about forty years ago, and that business did not go on successfully. Mr. D., father of Andrew, the manufacturer, would not render him any further aid in prosecuting it, and he sold out to Mr. Slater, now the richest manufacturer and most largely engaged of any person in the United States."

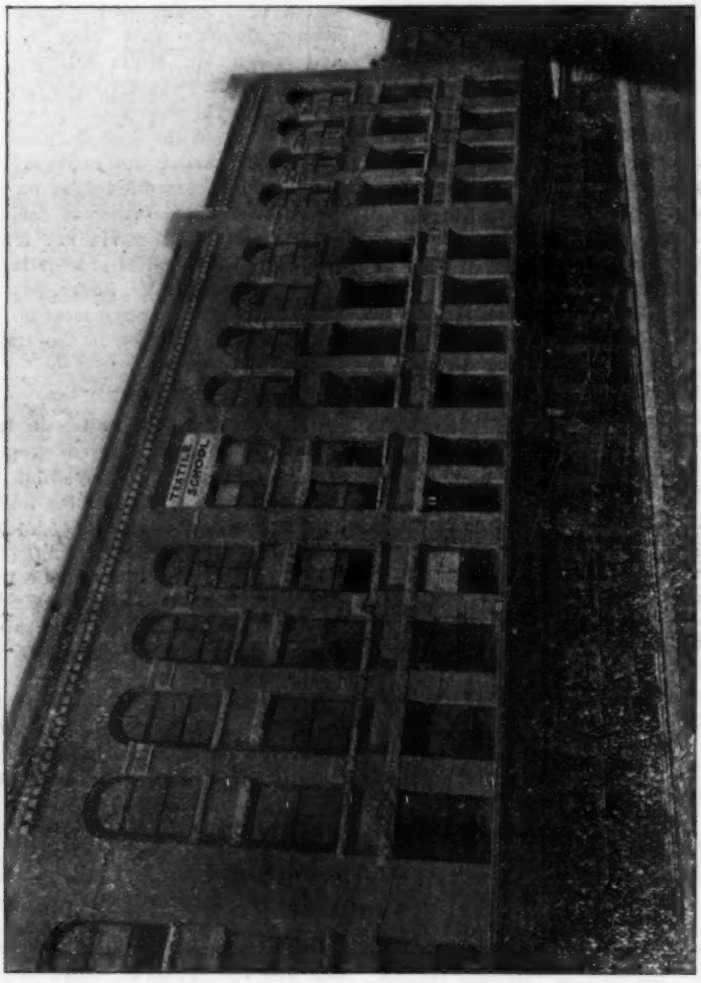
—The charges upon cotton in New Orleans for storage and compressing are the same as those governing the trade last year. We select the following charges, as they will be of interest to some of our readers: Storage for first thirty days on compressed cotton, 15 cents; extra charge for every additional thirty days, or part therefor, 8 cents; compressing, per bale, 50 cents; compressing and draying to and from compressing and drayage to and from press, per bale, 60 cents; turning over cotton for marking, per bale, 3 cents; extra bands, 5 cents each; sample hole covering, per bale, 2 cents; sewing up heads, per bale, 3 cents.

—The Moniteur Officiel du Commerce, Paris, says that the East Indian cotton crop for the year 1896-97 will be 26 per cent. less than that of the preceding year. The total is estimated at about 1,818,000 bales. Nearly as much land was under cultivation as in 1895-96, when the crop was unusually good. In Bombay, Berar, the territories of Nizam, and the central provinces, the decrease was most noticeable.

The Lowell Textile School.

The movement in favor of technical education in this country is making rapid headway. Not very long ago, there was very little interest taken on the part of the manufacturers although the leading foreign manufacturing countries, such as Germany, England, France had quite a number of well equipped textile schools. Now that the school of Lowell has been added to the educational institutions of this country, quite a number of other cities are discussing the probability of following the example of Lowell and Philadelphia, in establishing textile schools of their own.

In this connection it is probably better to make haste slowly, but we feel that a description of the Lowell school will not be uninteresting at the present moment.



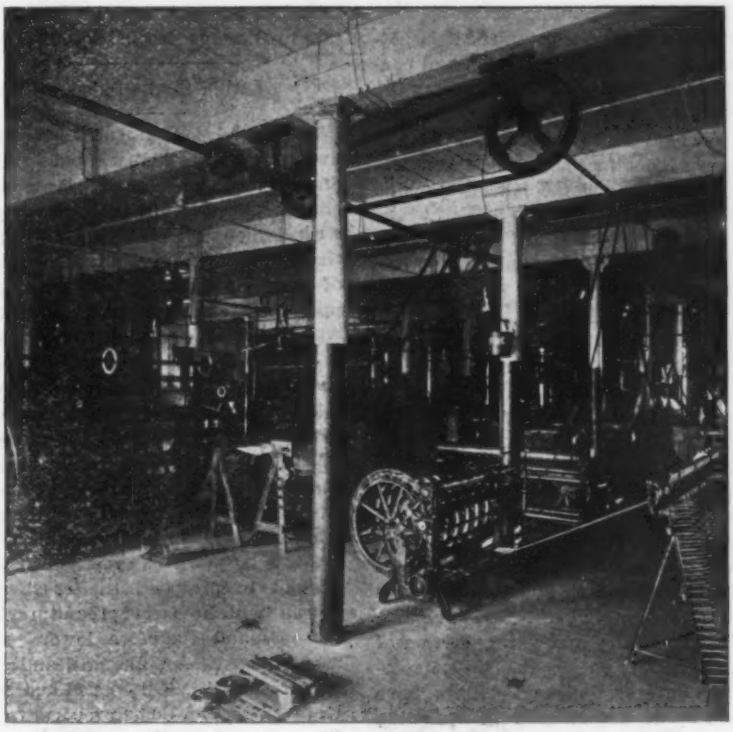
LOWELL TEXTILE SCHOOL.

The Lowell school was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and importance

to the textile interests of those countries made clearly apparent.

A year ago no steps had been taken towards the equipment of this school, although the corporation had been formed since 1895. The first year or two of the existence of the corporation was occupied with local and legal difficulties and it was not until the summer of 1896 that it was possible to take steps to equip the school. When once the ground was cleared, the undertaking was pushed forward to completion, and now, within one year of the first meeting of the equipment committee and the appointment of the director, the school has a complete equipment of carding, spinning, weaving and dyeing machinery for the treatment of all kinds of fibers and the manufacture of all classes of fabrics, under the change of a large and competent staff of instructors. The school opens the first week in October, for its second term's work, with a list of 200 students. It is regarded by competent authorities as having stepped at once into the front rank of American educational institutions.

The institution is a good example of a modern textile school. It is not modelled on any existing school, but is the result of close observations on the part of the director of the best methods of textile instruction, based on a number of visits to European textile schools; but beyond that, it is the outcome of the practical knowledge of manufacturing possessed by the trustees who have taken very great interest in its equipment.



WOOLEN DEPARTMENT

The collection of power looms includes representative machines from almost all of the American loom makers, and looms capable of weaving all varieties of fabrics. Among others, are noticed a group of jacquards from the Knowles Loom Works, Provi-

dence, R. I., and some handsome carpet looms from the shops of the Crompton-Knowles Loom Works, Worcester, Mass., with plain looms, dobby looms, leno looms, lappet looms and other masterpieces of weaving machine making from the Draper, Whitin, Lowell, and Mason Machine Shops. In the same room is a collection of machinery showing the various methods of preparing and dressing warps, both for cotton, woolen, worsted and silk fabrics.

The cotton spinning room is very complete, in this department it is possible to take a bale of cotton and convert it into yarn without it leaving the school for any purpose. This machinery was built at the works of the Lowell Machine Shop, the Mason Machine Works and the Kitson Machine shop.

The elegantly polished machinery is all of modern type and is actuated like all the other machinery in the school, by electric power.

One of the most attractive rooms is the woolen room, containing as it does a complete set of machines for the purpose of producing yarn from the raw wool. In this room, the pickers, cards, mule, twister, etc., are from the works of the Davis & Furber Machine Co., of North Andover, Mass., the Bramwell and Apperley feeds are from Geo. S. Harwood & Son, of Boston, while the burr picker is from the Atlas Machine Co., of Newark, N. J.

The chemistry and dyeing section of the school is one of the most important. Several thousand dollars have been spent this summer in equipping the room with all the apparatus that experienced manufacturers on the board of trustees of the school could recommend, or that experienced instructors found advisable.

The Lecture Hall is a handsome room equipped with electric stereopticon, adjustable desks, sliding design boards and black boards, and accommodates 250 persons. There are several class rooms and recitation rooms connected with it. It is not necessary in the course of this article to describe the course of instruction, excepting to say that anything connected with the carding, combing, spinning, or weaving of cotton, wool, worsted and silk is dealt with by the instructors, while there are excellent courses on the designing of all kinds of fabrics and of textile decoration as applied to fabrics and on dyeing. Auxiliary subjects, such as chemistry, mechanics, machine drawing, and art have important places in the curriculum of the school. Further details of the courses may be found in the catalogue of the school, which may be had on application to Director Brooks.

Cotton Seed Products.

The depression in cotton-seed product prices was inaugurated in 1896, due to an exceptionally large corn crop produced by the West and Northwest, which has continued all during the season of 1896-97 in consequence of another equally large corn crop made in the West and Northwest. Although Europe bought largely, still the prices realized were not remunerative. Corn, being so very cheap, was too powerful a competitor to suffer prices to go up. Should the crops in the West this season prove smaller than the last two preceding seasons, we may see higher prices for the product, but only for early months. Owing to a large cotton crop, which is at present in prospect, the crush this season will be larger than previous seasons, and therefore lower prices may be looked for, for meal and cake for late months. Oil opened last season at 15 c. according to reports to the Times-Democrat, New Orleans, La., and, contrary to all expectations of going lower, went up gradually to 17@18c, and closed the season at about 16@16½c. The Chicago packing houses bought comparatively very little throughout the season, due probably to the low prices of prime lard, which prevented business in compound. On the other hand, the unusually low prices of oil stimulated a trade that so far has had very little chance. It is the export of refined oil for soap-making purposes, in which

Marseilles easily takes the lead, with Antwerp following.

There are now four large mills and two small ones in New Orleans, with about 1000 tons seed per day crushing capacity. The product by the mills of New Orleans from cotton seed during the year ending Aug. 31, 1897, has been approximately as follows:

1896-97—Crush about 85,000 tons, producing about 3,230,000 gallons crude oil, say 64,700 barrels; cake or meal, 32,000 tons; lint, 3,400 bales; hulls, 28,000 tons. Lint averages about 20 pounds per ton of seed.

The season closed for cotton oil with a decidedly bullish tendency. With regard to the export demand, the superiority of American cotton oil and light stocks abroad contribute to the increased interest evinced by the foreign consumer in the article, notwithstanding the presence of abnormally high ocean rates. The scarcity of vegetable oils generally in Southern Europe and the advance in the English market are considered as helpful factors in further strengthening the situation. Lard, while of a fluctuating character, is, nevertheless, sufficiently high to keep up the demand for compound lard. Tallow rules firm. The domestic demand for cotton oil has also improved, but crude is a very scarce commodity, refiners having cleaned up most of the available holdings. With ordinary ocean freight rates, there is little doubt that the remaining stocks in the country could be readily picked up by exporters.

The following were the local New Orleans quotations during the undernamed years:

Cotton.	1896-97.	1895-96.
Seed, - - Ton	$ 7.00 @ $ 8.00	$ 7.00 @ $10.00
Cake, - - "	$17.25 @ $20.50	$16.50 @ $19.50
Meal, - - "	$17.25 @ $20.50	$14.50 @ $19.50
Crude Oil, Gal.	.17 @ .22½	.19 @ .23½
Refined Oil, "	.22 @ .26	.20 @ .26½

Cotton Seed to the Factory.

Editor Textile World:

In the September number of the "Textile World," your editorial appears to dispose of the question of shipping cotton in the seed in place of in the bale. You say "that the liability of damage in the bale was no greater, if as great, as it would be if shipped in the seed. The storage requirements for seed cotton would be greatly in excess of that required for bale cotton. The cost of handling also of seed cotton, or unpacked lint cotton, would be greatly in excess of that for baled cotton. The freight would be much greater in the case of seed cotton than compressed bale cotton. Express on samples is a small item."

The seed cotton will be shipped in box cars in bulk. Machinery will handle it at a nominal cost per ton. The lint will be taken from the gins to the picker room by machinery at a much less cost per ton than bale cotton can be landed in the picker room for. The cost of removing bagging and ties, picking the loose cotton from the bagging, and the cost of mixing in the mill will be avoided. In addition to these items, the charges that bale cotton now pays, aggregating some $7 per bale, will no longer need to be paid.

Again, by ginning at the cotton mill the annual saving in the cost of gin plant will be about $115,000,000 per annum. If the cotton is ginned by the best known methods, the value of the lint will be increased from one to three cents per pound.

Cotton ginned by this process can be spun without the aid of artificial moisture. The claim that cotton needs "ageing" before it is passed from the gins to the spindles will not hold good with cotton ginned by this method. The storage room needed at the cotton mill for seed cotton will be insignificant as compared with the room now in use for bale cotton. The seed cotton will be stored at the railway stations near the cotton plantation in place of at the mill, or in expensive city warehouses, as at present. If the crop is moved in the seed there will be no need of "cotton" houses on the plantation. The seed cotton warehouse at the railway station, where the farmer delivers his crop in the seed, will supersede both

the plantation "cotton" house and the expensive warehouses now in use at ports and at cotton mills.

As the case now stands, the cotton farmer must provide storage room for his crop in the seed. The warehousemen must furnish room to hold it in the bale. Last of all, the spinner must provide storage for his surplus stock.

Under the present plan of sending the crop out in the bale, the storage facilities are practically three times as great as would be required if it were shipped in the seed. The express charges on samples amount to 5 cents per bale,—a snug sum on a ten million bale crop. In round figures, the total saving on a ten million bale crop by shipping in the seed will be $180,000,000.

The statement about the cost of gins is not and cannot be proved; neither can it be disproved. Even if there were no difference in the cost of the gin plant, the sixty-five or seventy million dollars extra that a ten million bale crop must pay for the privilege of going to the spinning mill in the bale should be looked after.

St. Louis, Mo. C. H. MERRY.

[This is in reply to some comments of ours that appeared in our "Questions and Answers" department, page 97, in our September issue, on the system of ginning cotton alongside of the mill, to be spun into yarn. We do not believe in its practicability, and certainly not in its economy. Mr. Merry is the manager of the International Commission Co., St. Louis.—Ed.]

S. N. D. North.

News from Washington, which has been quite extensively disseminated by the press, that President McKinley was to appoint S. N. D. North, the highly accomplished secretary of the National Association of Wool Manufacturers, superintendent of the forthcoming national census, was somewhat premature. There has yet to be passed by Congress an act establishing a permanent census bureau, though, undoubtedly, such an act will be passed at the coming session of Congress, as its advisability is recognized by everyone. Until such a measure becomes a law, there will be no occasion on the part of the president to seriously take up the question of appointing a superintendent. When the time comes for the president to select a superintendent, no better name could be presented than that of Mr. North, who is in every respect well qualified for a position of this kind. He has given a great deal of study to economics and statistics affecting commerce and industry. As a statistician in census work, Mr. North has achieved an excellent reputation, as noted in his admirable report on newspapers, in connection with the 1880 census, and his able report on wool manufactures, in connection with the 1890 census. These reports are recognized by those who are qualified to judge, as models.

Cop Dyeing.

As agent for Charles Weber, and the introducer of his cop-dyeing system into Messrs. Sayles' establishment where Dr. Huntington was employed, possibly a few words from me in answer to that gentleman's letter in your August issue may be of interest.

Dr. Huntington admits that the above invention was successful to the extent of dyeing the cops throughout with the greatest uniformity, thus reaching to this extent, at least, the long sought for goal, and considers it might be successfully employed in mills using up their own colored yarns but condemns it from a commission point of view because of the alleged difficulty of matching exactly any particular shade of color.

Even admitting the presence of the last named difficulty, I submit that it is an invention of great value to manufacturers, most of whom do weave their own dyeings, and the fact of its adoption by mills in Europe, none of which, so far as I know, have abandoned its use after once installing it, goes far to prove this. In spite of Dr. Huntington's opinion to the contrary, by careful preparation of

the baths, etc., the same shades can be produced over and over again with as great exactitude as in the hank or otherwise, and, from a commission point of view even, the business could easily be made valuable by the establishment of certain standard colors, which could be furnished again and again as wanted.

As a matter of fact the inventor, Mr. Weber, runs his invention himself as a commission dyer only, and does not weave. But for all that he now does little or no dyeing in the cop. This will sound strange, but from experience it has been found cheaper and better to do the dyeing on the slubbing bobbin. Not only is such great care in the dyeing rendered unnecessary, as all slight imperfections entirely disappear in the subsequent doublings and drawing out during the roving and spinning processes, but also the yarn acquires in this process a lustre and brilliance which no other method of dyeing that I am aware of, will give it. Thus the cop-dyeing has yielded in the parent establishment to slubbing dyeing, which process was also exhibited to Dr. Huntington, at Saylesville at the time.

Bleaching is however still done in the cop, and if for that alone the invention has value. As to Dr. Huntington's assertion of the loss in waste from closed ends of the cops, that is absurd, the cops being spun on perforated tubes and dyed in spindles and there being no more waste than in gray cops similarly spun.

In spite of all this, I was unable to introduce the system commercially into this country, which I attribute to the fact of its having been preceded by so many failures of inventions in the same line. I gave up the attempt some time ago.

Another system of cop dyeing is now being brought out in England, and has been patented for this country.

C. R. English.

[I thank you for the opportunity of replying to the letter of Mr. English, and I will say that I cordially agree with him when he says that "it is an invention that is of great value to manufacturers.....who weave their own dyeings." I will give my influence to aid Mr. English in any attempt to introduce the cop-dyeing system or the slubbing-dyeing or the roving-dyeing in any mills that weave up their own dyeings; but for mills doing commission work I will not.

I am perfectly familiar with the dyeing of the slubbing, and at the Sayles Bleacheries adapted the machine of Charles Weber for the dyeing of slubbing and roving; but the same thing which militated against the success of the dyeing in the cop, applied strictly to the dyeing in the slubbing and roving.—Dr. H. Huntington.]

The Dry Goods Trade of New York.

August was an extremely satisfactory month among the trade. It was the best August in point of sales for five years, and it is also said to have been the best single month within that period. This showing is especially noteworthy when it is remembered how low prices are now, compared with five years ago.

The second of the wool sales (first series) had many of the objectionable features of the first experiment. Much larger lots were offered, but not so many of them. The entire offering of each lot was sold peremptorily to the highest bidder and there were no withdrawals.

A silk man says that 11,768,757 kilos of silk have been treated by European finishers from Jan. 1 to Aug. 1, almost equaling the first seven months of 1895, which made the largest record ever known.

William Davies, the resident buyer at 51 Leonard St., has added to his list the firm of Shipper & Block, Peoria, Ill.

Norwood Bros., of Brooklyn, the Unicorn lining manufacturers, have opened a New York city office at 34 Thomas St. H. F. Bray is in charge.

George B. Thirkield, long with Strawbridge and Clothier, of Philadelphia, has joined Bosut Pere & Fils foreign dress goods department.

David Mayer, formerly with Creigh-

ton & Burch, has opened an office at 34 Thomas St., as a commission merchant.

Roman stripe combinations are multiplying in silk effects, and among so many plaid and bright effects, do not seem gaudy.

One German hosiery importing house advertises that it will meet the Dingley bill by reducing prices.

Raw silk is rapidly hardening.

Gone to Europe: F. Muser, of Muser Bros., lace importers; L. W. Mix, of Case & Mix, importers of dress trimmings; T. Vietor, of F. Vietor & Achillis' silk department; Louis Budell, Paris representative of F. Vietor & Achellis; Oscar Von Bernuth, of Hardt, Von Bernuth & Co.; Jean C. Naegeli, manager foreign silk accounts Fleitmann & Co.; Ewald Fleitmann, of Fleitmann & Co.

Among the popular novelties in the dress goods line are nep effects in iridescent and fancy silk and mohair weaves, poplin plaids, and side band effects.

In ribbons, black taffetas in plain and moire effects are in brisk demand.

Silk braid fronts in military styles are among the trimmings called for. Jet, silk cord and embroideries are also used for this purpose, and fancy bands for skirt trimmings. Astrachan braids in Persian effects are much sought.

Returned from Europe: Otto Hesse, manager H. A. Caesar & Co.'s dress goods department; G. E. Field, of Dent, Allcroft & Co., kid gloves; M. Wertheimer, the kid glove importer; W. P. Gill, of W. P. Gill & Co., ribbon importers; S. Oppenheimer, of Oppenheimer & Levy; H. B. Yordum, of Yordum Bros. & Co.

Velvets are in increasing demand.

Cotton Market.

The cotton market is in a state of uncertainty, the quotation for middling uplands at present writing being 6⅞ cents, against a quotation of 8 1-16 cents in our September number. The prospects are that prices will rule low during the present season, and especially will this be the case if the crop should equal current estimates. The Government report, that was issued showing the condition of the crop on the first of September, was lower than the trade had anticipated, but it had little effect upon prices, owing to the apathy of speculators and spinners. The visible supply of cotton is lower than for many years, and the bulk of it is held in England and Continental markets. We think that the trade has quite generally given up any such extreme estimates of the crop as ten million bales.

The market may be denominated as a waiting one, and positive convictions are out of favor. The takings of spinners, both North and South, have been greater since the first of September than for the corresponding period of last season, while the receipts at the ports have been considerably less. At this time last year, about seven per cent. of the season's crop had appeared in sight. Of course, the period for guessing at the size of the crop still continues, but there are some important factors that should be taken into consideration, such as the lateness of planting, it having been three to four weeks behind the usual time throughout the South, and the fact that a large area of the land in the Mississippi Valley was overflowed, and planting deferred for fully a month. There is one thing that the trade is well aware of, from experience: that the estimates are better deferred until after the crop is picked, ginned, and baled, before anything reliable can be reached. Latham, Alexander & Co., New York, issued a circular last month, in which it made the following interesting statement:

"According to the government reports the number of acres planted in cotton in 1894-95 was 23,688,000. This was a remarkably favorable year from start to finish, and the total crop proved to be 9,901,000—this was the largest crop ever raised. This year the government reports the acreage at 24,091,000, and even had the season been as favorable in every respect as that of 1894-95 the outcome of this

years's crop could only be 10,117,000 bales; but, from the beginning up to this date, the season has been notoriously far less promising than in 1894-95, and even with the increased acreage it is not unreasonable to expect a marked falling off from the yield of that year."

Concerning the crop of Sea Island cotton, reference may be had to the recent circular of H. F. Dutton & Co., Gainesville, Fla., who are regarded as excellent authorities concerning this crop. We gather from this circular that "in South Carolina and Georgia, although the outlook has been favorable up to the 1st of August, it is not improbable that in consequence of the season being late, especially in Georgia, contingencies may arise, such as shedding, rusting, blight, caterpillars, and unfavorable weather, which may still cut the crop materially short. A careful estimate shows that about thirty and thirty-five per cent. less acreage was planted in Georgia, principally on account of low prices. Most of the acreage was planted in upland cotton. In Florida the outlook is not as favorable as it was on the 1st of August. The latest reports show cotton to be shedding and rusting more or less all over the Sea Island district. There is no doubt the acreage has been curtailed at least fifteen per cent. this season. All over the State it is claimed there will be a very short bottom crop. Telegrams from all over the sea island cotton district report the weather more or less unfavorable during the last week, and that rusting, caterpillars, and other injuries have affected the cotton. More than 85,000 bales, cannot be predicted."

The latest advices from Egypt represent that the new cotton crop is about a fortnight earlier than last year, and that the danger of the September fogs is thereby greatly diminished. Reports from the interior are said to be excellent.

Wool Market.

There has been no falling away in the strength of the wool market during the past month, but, on the contrary, the feeling is much stronger, with anticipations that prices will rise to a higher level, sufficient to warrant the importation of foreign wools, notwithstanding the present tariff. The only thing, apparently, that militates against the importation of the raw material is the fact that wools are also advancing in price abroad. It seems to be pretty certain that a number of American buyers will make purchases at the current auction sales in London, though the selections at this time of the year are always poor, comparatively. Dealers have been operating among themselves to some extent during the past month, but much the larger proportion of the wool sold has gone into consumption. The advance in the price of wool has been considerably greater than in that of the manufactured article. The knit-goods people feel it more keenly than weavers.

It is our impression that knit-goods manufacturers could greatly improve the condition of their industry, if they would turn their attention more to a diversified product, and compete in the market with designs and favored styles that are now imported. We will not undertake, at this time to state how this can be accomplished, but we think that there are practical ways which should receive the serious consideration of manufacturers.

From present appearances, the maximum price for wool has not yet been reached. At any rate, this seems to be a conviction of the holders of the staple, as noted in their attitude of indifference in meeting the demands from manufacturers. The latter, in consequence, are more disposed to meet current prices than heretofore, if in want of wool.

Territory wools still take the lead, which now are bringing from 46 to 52 cents clean for medium to choice staple. Ohio and Pennsylvania fleeces are in an exceedingly strong position, the XX and above grade commanding a price, on the scoured basis, of 60 cents. Australian wools are in special favor, 36 cents being the average price

in the grease, and some lots commanding as high as 34 cents for Sydney and Port Philip. The demand for worsted yarns continues steady, and spinners show independence, as noted in our yarn market on page 129. In the English markets, 60's tops from Adelaide wool are selling at 18 to 19 d.; and those of Cape wool at 18¼ d., for good quality. Advices received by us from England, emphasize the fact of a short supply of merino wools, due to the extension in production of crossbred wools in the Australian colonies and the River Platte region. This, in time, must have the effect of relatively advancing the price of merino and depressing that of crossbreds. We also learn from the same source that the consumption of all kinds of wool is fairly kept up in the woolen districts of England, but that the serious aspect of the labor disputes in industrial quarters counteracts to some extent the more favorable situation of the agricultural interests, and this may prejudice the ordinary autumn home trade. Other advices from the neighborhood of Leeds represent that there is no great amount of activity "in any branch of the English woolen cloth trade, but business may be said to be in a fairly satisfactory condition. The output of ladies' costume cloths continues as large as ever, but prices cannot be quoted more satisfactory. There is about an average turnover in beavers, meltons and friezes. Serges of best make in dark colors find most favor just now among buyers, together with vicunas and heavy overcoating. Worsteds of all descriptions are comparatively neglected, but a more confident and hopeful tone prevails. There is very little doing in the shipping trade, and business during the past month has been most unsatisfactory. Under these circumstances it is encouraging to find a little more activity on Canadian account. Employment at the mills is about an average, manufacturers being engaged on winter repeats and goods for delivery next spring. In the heavy woolen district trade is only dull."

Recent advices from Goldsbrough, Mort & Co., Melbourne, show that good and well-distributed rains have fallen during the past month, and the country generally is recovering from the severe drought that has prevailed. The probable shortage in the clip, arising as well from the actual stock losses by drought as from the diminished yield per head of the survivors, is the subject of many and varying estimates, all of which, until some basis for estimation is furnished by actual returns at shearing, lack sufficient data to attach weight. Roughly speaking, these estimates vary between 100,000 and 200,000 bales; but until more reliable indications are available, an estimate is regarded as of too speculative a nature.

South American Trade.

The prospects are that the recent visit of the delegates from the South American countries will be of considerable benefit to the manufacturing industries of this country. That seems to be the opinion, at least, of Prof. Wm. P. Wilson, director of the Philadelphia Museums, who had much to do toward extending an invitation to this representation from the countries south of us, to visit the United States for the purpose of looking into our diversified industries. It is stated that contracts have already been entered into for the shipment of manufactured articles, amounting in value to a number of millions of dollars, touching more particularly the industries of Pennsylvania.

"It may not have been," says Prof. Wilson, "when the opportunity was given to collect the raw products from the World's Columbian Exposition at Chicago, that this would be the beginning of such an institution as the Philadelphia Museums, which should later claim the attention of the world, and bring together the first great business congress in America. Some of our most esteemed citizens looked at the materials then brought together, and wondered what advantage they could ever be to the city of Philadelphia, and

even characterized them as a mass of rubbish. It was not possible at that time to outline the commercial side of this work, and to show the intent which then existed of building up an International Bureau of Commerce. The work is still in its infancy, although it has developed some striking results. No business organization of equal magnitude exists anywhere in the world. With the Philadelphia Commercial Museum to-day are connected the representatives of over 125 chambers of commerce from every quarter of the United States, and over 40 of the finest commercial bodies in foreign countries. Its organization is so constituted as to bring commercial information from all leading countries to this one centre, and to make it a systematic point of distribution. The great collections which are becoming so interesting to the public only supplement the information brought from all quarters of the globe to be systematized and distributed for the advantage of the large manufacturing and productive interests of the United States."

We state upon the authority of Prof. Wilson, that in New England, direct connection has been made with certain cotton mills for future supplies. The industries most favorably affected are the shoe, carriage, fire-arms and watch manufactures. A considerable amount of shoe machinery is likely to be sent to South American countries, for the establishment of factories in those regions. Orders have also been placed for large quantities of pig iron, gas and cannel coal, and not the least interesting is one order for $18,000 worth of brick machinery. There seems to have been no demand on the part of our South American visitors for American woolen fabrics. It is reported, which is not uncommon, that a number of the members of the visiting party found they had been purchasing in Europe various lines of goods which were made in the United States, these goods having been bought as European manufactures. These personal visits by the merchants with which we desire to have commercial relations should prove beneficial to our manufacturing industries.

Textile Industry in Russia.

Consul Monaghan, of Chemnitz, writes to the State Department, Washington, D. C., that "the textile industry in Russia, established in 1848 by French emigrants in Moscow, consumes more than $7,720,000 worth of raw silk, imported from Europe and from the extreme East. This industry is almost exclusively concentrated in the district of Moscow, where, since 1855, there have been built 148 large factories, containing 8874 looms, producing goods worth more than $3,600,000, and 72 establishments of lesser importance. In other districts, are found 25 mills, producing goods worth $600,000. The ribbon industry, protected by the highest import duties, has made great progress during recent years. All the ribbon factories are in or near Moscow; their annual production amounts to over $350,000. The cotton plantations, established in 1885 in the district of Ferghane, Russian Turkestan, are now of considerable importance. The cotton production amounted in 1890 to 10,800,000 pounds, and 17 establishments were occupied in the ginning and cleaning of raw cotton. In 1892 the cotton industry of Russia employed 191,290 looms, 639,000 men, 210,000 women, 8200 girls, and 18,000 boys. The mills situated in Moscow and in the districts of Vladimir, Tvet and St. Petersburg, are producing cotton articles worth nearly $140,000,000. Russia, the first nation in Europe in the production of wool, has 45,000,000 common sheep and 15,000,000 merino sheep pasturing on the vast prairies of southern Russia. Russia's wool production amounts to 361,120,000 pounds annually, nearly 6 pounds per sheep. In 1895, there were 68 spinning mills in the districts of Moscow and St. Petersburg, employing 4789 hands and producing wares worth more than $2,600,000. Moscow and surroundings lead in woolen weaving; then come Tver, St. Petersburg, Warsaw, Lodz and Kharkov. European Russia has nearly 450 mills, employing 50,000 workmen, and producing woolen articles worth $23,000,000."

COTTON DEPARTMENT.

The Bale Breaker.

W. SCOTT TAGGART.

Probably one of the greatest changes that have come over the methods of preparing the cotton fiber for the spinning process during recent times, is the introduction of labor saving appliances in the first stages of working up the raw cotton. Three important mechanical arrangements may be noted in this connection, viz: the bale breaker, travelling lattices and the hopper feeder. Certainly no new mill, and practically all old mills, whose owners desire to be on a modern footing, can afford to dispense with these adjuncts to economic production and superior qualitative results. With few exceptions no new mill of the present day is without the appliances named, and in the following notes it will be our duty to point out that not only is this attitude essentially necessary from an economic point of view, but that greatly improved results accrue from their use.

We will not concern ourselves with the previous history of any of the methods mentioned. They have each passed through a probationary period during which a good deal of suspicion, distrust, and considerable disparagement was associated with them; but all the initial difficulties have been overcome and the experimental period now belongs to the past; they take their place along with the other processes in a mill and are considered an important and necessary factor in the industry.

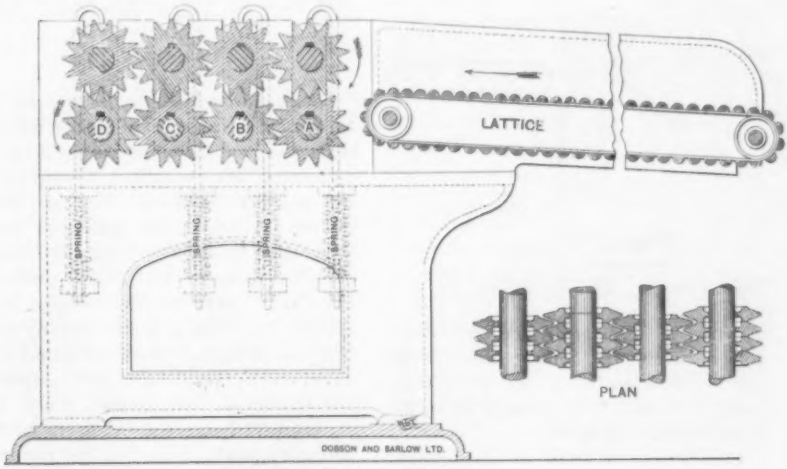
Owing to different methods of construction of mills, new or old, the disposition of work rooms and the various types or positions of the preparatory machinery, we find a variety of arrangements of bale breakers, lattices and hoppers in their relation to the opening machines, and an unusual degree of ingenuity is often seen in the methods adopted to overcome the difficulties associated with the conditions mentioned above.

To take the case of a modern mill, we generally find that the opening department occupies one section of the mill and includes three stories. The top room is used as the bale room; to this the bales are hoisted direct from the railway wagon or the lurry and

MR. SCOTT TAGGART.

arranged in some accessible form for mixing purposes. Under the older system of hand mixing, the bales in their respective quantities as to color, length of staple and price, etc., would be opened, and the hard, lumpy cotton, due to the extreme pressure put upon it in the baling press, would be pulled into smaller portions by manual labor. Anyone who has seen this operation performed must have been struck with the tedious and unnecessary labor involved. Its slowness, apart from the perfunctory character with which even under most careful

management it is performed, is peculiarly disadvantageous. In face of the enormous productions of a large modern mill it becomes almost prohibitive to employ such a method preparatory to mixing. It is not to be denied that, granted one employs hands enough and has a minimum of regard for time and productions, that far better results can be obtained than by mechanical means. Carried far enough, isolation of the fibres might almost be obtained; but since average results must be the foundation of our judgment, one can have no hesitation in saying that the mechanical appliances now employed are superior in every respect to the system of hand pulling.



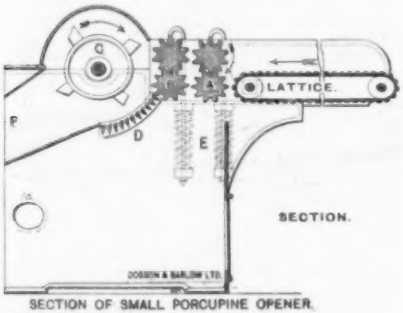
SECTION OF BALE BREAKER

Under this method, the results of the manual labor would go into the room below, perhaps partially mixed in consequence of several hands opening bales of different characters, or probably, complete bales, alternately in suitable order, would be put down and arranged in species of layers in the form of a large stack of a mixing.

Now obviously the primary purpose of loosening the cotton from the bale is to permit the fibers to assume a more natural condition after the severe pressure they have been subjected to in the baling. The air and moisture of the atmosphere can then more easily circulate among the fibers and give a kind of tempering effect to the cotton; but this desirable effect is considerably neutralized by the fact that in a large mixing, the superincumbent cotton, by its weight reproduces in a modified degree a state of things existing in the bale, and very little observation will prove that a large mixing gradually subsides into a smaller bulk as it stands in the room. Moreover, if a given volume of cotton taken from a mixing formed by hand pulling be compared to a similar volume taken from a machine-formed mixing, the weights are not perceptibly different. This proves that under average conditions the hand pulling system has no advantage over the machine method. We shall be able to show, however, that the mechanical system has clear advantages, granted, of course, a good machine is used. In such a system the bales of cotton, in the proportion required for producing the desired mixing, are grouped around the feeding lattice of a bale breaker. The person in charge starts the machine and alternately takes cotton from the various bales, and in this way a mixing effect is produced on the lattice, and in its passage through the machine; this of itself is an advantage. Of course complete

bales may be passed through the machine in some specified order and reliance placed on the mixing in the room below, but mixing at the machine is preferable.

For most cottons the bale breaker is made with four lines of rollers: the rollers are not solid or even fluted; they are built up in star or spiked-tooth shaped sections, threaded on a strong shaft. Their arrangement is such that the teeth of one roller pass through the spaces of the next one, and when they occupy their closest



SECTION OF SMALL PORCUPINE OPENER.

position a small clearance only is allowed. Moreover a large draft is allowed between each set of rollers, varying from 5 to as high as 30 in the total for the machine.

The lumps of bale cotton passing through such a system of rollers is pierced in every imaginable way by the teeth, and the draft of the machine pulls them asunder in a manner scarcely possible by the best hand pulling. Even if a lump rather larger than need be does pass through, it is not more unusual than what occurs with hand pulling, whilst the lump cannot possibly escape the penetrating and loosening effect of the teeth, which palpably renders the subsequent action of the hopper or opener a far easier and milder one than would otherwise be the case.

In some machines specially adapted for the better class of fibers, such as Sea Islands, a pedal arrangement is sometimes adopted, though experience is now pointing to the fact that the four-line system of rollers is quite equal to dealing with this class of cotton. An additional cleaning effect is also sought for in applying a small porcupine opener and dispensing with one or two lines of rollers for dealing with the low and dirtier kinds of cotton. Illustrations are given of the types mentioned. The production of the bale breaker is such that a single machine in charge of one man is capable of supplying a large mill with pulled cotton and its economy in this respect is a most decided advantage.

[A more detailed description of the mechanism of the machine herewith illustrated, is given in the writer's recent work on "Cotton Spinning."—Ed.]

Doublings.

The exposures made from time to time, in this country and other places, regarding the injudicious crowding of doublings, have been less heeded than the subject deserves. It has been proven in scores of instances that yarn spun from a well carded sliver will be stronger and more uniform than that made by the regular processes. Is it not possible that by getting out of the old ruts we might not only save expense but also improve the quality of our goods. When we consider the interest taken in every invention brought out for the purpose of improving any of the processes through which the fiber is, under the present system, made to pass, we are somewhat taken aback to see how little heed is given to the question of doublings.

Modifications in this direction seem to withstand every practical method carried through with the object of proving the falsity of the old time system. Still there is no getting out of the fact that if we can trust our senses and testing machines, the less the doublings the better the record of breakage. But, says an old spinner, the rough, furry character of the thread will not pass muster in the grade of goods we make. Let me remind him however that he has often put up with furry filling made by the regulation amount of doubling and drawing, the reason for which was found to be in

climatic derangements, and the goods were not entered as "seconds" on that account either. This noise about rough, furry yarn is a mere trade expression of the yarn buyer in order to secure a rebate of time or money on the transaction. It is stronger yarn, and hence better, and more serviceable goods that I am after, not weak, fancy, snowy material, that as an old weaver once said, you could "blow a spittle" through.

Besides there are several sorts of cloth which a little furriness is an advantage to,—such as domet, duck, or Canton flannels, and many others where the extra strength and regularity of the goods would overcome every other obstacle. This latter phrase "the regularity of the goods," is the soundest argument in favor of the smallest number of doublings.

Possibly there are promptings connected with a system looking in this direction which would carry more weight in the views of the manufacturer, such as outlay and income. The regularity of the goods, however, should fill the first place of importance. Every experiment with slivers of cotton suitably picked and carded, has been successful in demonstrating that the thread was evener and sized more regularly than that from the doubled and drawn roving,—the conditions up to the cards being exactly similar. Thus we find as the commencement of the argument that the carded sliver is the most uniform and open, and therefore best adapted to draw evenly. Why are we not able to keep it so through the subsequent doubling and drawing to which it is subjected?

I am convinced the numerous and searching experiments that have been made with slivers from each and every process, proves, without caval, that the even sliver is that produced from the card, and the uneven one that fed to the spinning. If, then, all this array of machinery and expenditure of power is kept in for no other purpose than to clear the thread a little of the furriness which all cotton thread has more or less, after being spun, said furriness must be a weighty objection or there is a large amount of energy spent on small returns. It must not be thought that my aim is to banish doublings as a useless encumbrance of the preparing, for it is not. The object is to just show that all they are good for is to bring forth a thread cleaner and freer from furriness, and even that at the expense of some strength.

We are told that without doubling and drawing the fibers would not be sufficiently parallel at the final process. I do not consider that an argument worthy of notice, because there are frames to-day spinning, some card sliver, some railway sliver, and many drawing and slubbing sliver,—all of which are parallel enough to give no trouble, and making good work for the purposes intended. It is this laying of the fiber and disengaging of the small quantity of "shorts," called "clearer waste" that gives us the smoother thread.

For this we are expending half the energy required in our preparing departments. For what purposes do we size the warps? To impart strength by laying the furry fibers, to give flexibility, to save harnesses, and to bestow unto the cloth the necessary appearance. Now it is evident, warp yarns require more strength than weft. We would think therefore, any plan that could be perfected by which a more elastic and stronger warp could be secured from the same stock, would receive encouragement. During the month of cold, dry atmospheres, when electricity is holding the flowings standing out two or three inches from beams and ironwork, we are well supplied with furry yarn. It comes to the slashing in a worse state than the cutting away of half the doubling would bring it. But after undergoing a coat of good penetrating size, the trouble disappears. There is no further annoyance except the weaknessess consequent on the action of the electricity during the drawing processes, a thing for which the doublings and the number of machines employed on their account must be made

responsible. We have therefore incontrovertable evidence that the sizing process smooths and lays the furriness caused by electrical influences. Why then, we would inquire, can not the furriness for which the want of doublings is blamed, be not sized down in the same manner, and the somewhat smooth characteristics wanted in the cloth secured from a leveller and stronger drawn yarn.

There are some mills engaged in yarn making from comber and other sorts of waste. These aim more at strength than cleanliness. The plan by which a thread of an average strength can be made from waste stock is to extract at picking, card lightly, and spin right away without troubling yourself about paralleling and drawing by doubling. By this plan we secure all the strength possible at the cheapest figure, and can afford to meet the market at a profit.

There are other mills employed in manufacturing hosiery yarns. This in my estimation is a very peculiar business, and should be thoroughly studied. There are many kinds of hosiery yarn that want to be furry, so that the goods will have a soft, comfortable feel. Strength is another characteristic made necessary. To fill an order of this kind, throw off every doubling possible and from the very cleanest stock, card and draw to the weight of sliver the numbers wanted require, and spin from slubbing. Here we have a plan by which a well furnished hosiery yarn mill can fill an order to suit the price, without incommoding and adding expense by changing. The whole thing resolves into this: we do not understand doublings. They were put in for the purpose of producing the best thread that could possibly be manufactured for the class of goods desired. These goods have sold well, and the concern has made money; what is the use, then, of making any alterations? Nov.

Mill Management.

Some mill men will tell us that what he does not know, he can hire men that do. Yes, but his company has to pay for such men, and they have to pay dearly for supposed improvements made by such men of no practical knowledge. At one time an agent conceived the idea that the small cards could be changed over by putting on fillert clothing screens under the cylinders and leaders, and do as much work, and just as good as the revolving flat cards. After spending a few thousand dollars he learned that it could not be done. It does not take a very bright card grinder, to know that such a change on the small card, for such a purpose is absurd, and impossible.

Again, we may cite the agent who very recently hired an overseer for his spinning, and paid him the munificent sum of two dollars and fifty cents per day (his first job of overseeing), and the young man was anxious to improve, and have things run right. So he wanted to reset the rings and get the spindle somewhere near the centre. But the agent would not let him do it, as, he said, they were all right when the frame was first started, and they never need resetting.

Any bright dofter would know it to be of importance that the rings should be re-adjusted as often as once a year. And what of the agent or superintendent that would not allow this done, or would not give his overseer travelers enough to change (simply to replace one as they wore off), never allowed a whole side or frame changed at once. It may seem strange that such men are in control in this enlightened age, but they are there all the same. It is the agent or superintendent that knows his business, and has some practical knowledge of the mill, that hires good overseers and pays them fair wages, and then holds them responsible for the results, after giving them suitable tools to do with. Such men will consult with their overseers and give and obtain all the information possible, to the lasting benefit of both. If an agent makes his overseers feel that they are a part of the executive force of the plant, they will be more in harmony with his ideas, and things will run more smoothly,—with better results all around.

Some agents and superintendents feel suspicious that if they tell their overseers anything, they will know too much; and will be seeking a better position. This is just what makes the best overseers, if their ambition leads them to look higher. It makes them better, and more anxious to make a good record where they are. And what if a certain agent turns out a superintendent every year from among his overseers? His plant is all the better for it, and he gains an enviable record as a maker of first class mill managers, and he always has a first class running mill. Nothing is more deplorable, and damaging to the cotton mill, than to cause the overseers to feel that they are of little account, mere second hands or running boys for the agent or superintendent. M.

A Spinning Ring.

The accompanying illustrations are those of a spinning ring which is meeting with a favorable reception among cotton manufacturers.

It is a single flanged ring, and instead of being turned from a solid blank as is the case with many in common use, it is formed up from

FIG 1.

sheet steel, securing, it is claimed, several important advantages over the ordinary ring.

It is made by a process at a cost that enables the makers to sell two of them at the price of one double ring, so that a mill may be equipped at one half the cost. It is figured that the saving of interest on the additional cost of the idle flange of a double ring would be no inconsiderable item in a large mill.

Another important claim is the formation of the flange by repeated blows of the hammer. Every one familiar with the working of steel knows that hammering greatly improves its quality, and by applying this principle, a denser and more durable flange is obtained.

In a double ring, both flanges must be of the same diameter in order that they may be successively used, consequently each sized ring must be fitted to a corresponding sized holder. In a single ring this is not necessary, so that where it is desired to increase the size of the rings used, they may be fitted to the old holders, thus saving the rings used, they may be fitted to the old holders, thus saving the expense of new ones. Fig. 1 shows the

FIG. 2.

ring as fitted to an ordinary holder; Fig. 2, as adapted to a holder intended for a smaller ring.

Being bell shaped below the flange there is no place for dust to lodge.

Besides the maker's ordinary rings, which they guarantee to be as true as those of any other make, they make a specialty of a round ring which is almost a perfect circle and is particularly adapted to fine work.

Circulars and samples may be obtained by addressing the manufacturers, the Worcester Spinning Ring Co., Worcester, Mass.

--The Indian Textile Journal asks this question: A slubbing frame is now making a ⅞ hank roving, with a 40 change pinion on, and a one-hank roving is wanted. What pinion is required? Answer is given to this effect: That to change from one count or hank to another, the rule is to multiply the count or hank at present being made by the number of teeth in the pinion or change wheel, and divide by the count or hank required. $40 \times .875 \div 1 = 35$ pinion required.

WOOLEN DEPARTMENT.

Style Suggestions for Woolen Manufacturers.

There has been no season of recent years in which the sale of goods has been so rapid, as the present light-weight season. Soon after the lines were opened, the price of raw material began to go up and manufacturers advanced prices of fabrics to keep pace with this advance, but it was not possible to adjust the price of spring goods in keeping with that of raw material, although there was some very marked rises, especially in worsteds. Every manufacturer who had a line out, has taken enough orders to keep him busy, and whether all these orders are legitimate or not remains to be seen.

It is a generally conceded fact that many buyers placed larger orders than usual, so as to protect themselves on the increased price on duplicate orders. It has been rumored that one Rochester clothier had placed orders for a hundred thousand dollars worth of goods more than he could possibly use. Be this as it may, there is undoubtedly a very healthy increase in the volume of business done, and the wholesale clothiers are having an excellent business which will create a demand for heavy weights.

The kersey business is picking up, and the demand for a low grade kersey is becoming more important every day. The bulk of the dollar kerseys are now $1.15 and $1.20, with some new makes entering the market at $1.10 and $1.20.

The domestic department of a foreign house is endeavoring to make a corner in the kersey market. They purchased a large stock--some six or eight thousand pieces—which they are holding to unload this month, when the demand is heaviest; and in order to keep the price of kerseys up so as to obtain full value for their stock goods, they are buying lots right and left, and every manufacturer who starts up on this fabric is paid a fancy price for a few hundred pieces so as to keep him out of the market, until the demand is at its height, then this firm will unload. Manufacturers of this grade of kerseys who are smart, will hold on to all their goods until the corner is about made, then unload.

There is a large demand in the cloak trade for these fabrics, and much business can be done at $1.20 in blacks and blues. There is always an early fall demand for light tan kerseys, and these made at a price would obtain a ready sale, as all tan kerseys are either advanced so much as to place them out of reach of the cloak maker, or else have been entirely withdrawn.

Relation of Pattern to Structure of Cloth.

BY THOMAS R. ASHENHURST.

In every fabric, whether mansion, mill, warehouse or bridge, which is to be ornamented, due regard must be paid to structural stability, and so of cloths. The first and chief considerations must be the purpose to which the cloth is to be applied and the nature of the ornamentation. If the ornamentation is to be by color only, the ordinary conditions of structure will apply; but if the ornamentation is of a structural character, the ordinary rules for building a cloth may have to be departed from.

To understand fully what is meant by this, it will be necessary to go to the root of the matter. One frequently hears the term "a well balanced cloth;" and the term is frequently misunderstood. We may use the term "a well balanced building," but it would be a question whether the term was applied to the architectural (orna-

mental) features, to the useful, or to a combination of the two. In cloths, the term usually applies to a structural balance, with which the ornamentation, whatever style may be adopted, does not interfere. Then the subject is well worth careful examination.

So-called plain cloths may take a first place in this examination,—that is, cloths where the warp and weft interweave with each other alternately. It may be said that a typically perfect plain cloth is one in which the warp and weft are equal, and that the number of threads per inch, both ways, is such that a proper degree of bending takes place in each, and that the spaces between the threads bear a proper relation to their diameters, so as to ensure the best angle of curvature. But it frequently happens that a plain cloth, so called, must be built differently, either for the purpose of ornamentation or for utility. Take two extreme cases: One in which it is desired to form a cord or rib in the direction of the warp, and the other, where the rib must be across the piece. In either case the conditions of a typically perfect plain cloth will be completely destroyed, and apparently the balance of structure upset, though such need not necessarily be the case.

Let the cord, or rib, be formed in the direction of the warp. This means that the warp threads must be thick, or, what means the same thing, two or more threads must be run together as one, and that the spaces between the threads must be commensurate with their bulk. It means also that to preserve this cord, the weft must be fine; and also that those weft threads must be laid together as closely as possible; and the finer the weft and the more closely they are laid together, the more perfect will the cord appear. Then what becomes of the balance of parts. It would appear at first sight that the heavy warp would overpower the fine weft. Take into account the fact that no bending would take place in the warp, in consequence of its superior bulk, and that there must be considerable space between the adjacent threads to allow for the bending of the weft, and that the weft threads will be put in in actual contact with each other,—and the apparent discrepancy begins to disappear; and, as a matter of fact, in a well-built cloth, where proper regard is paid to the relative diameters and the angle of curvature, the old-fashioned notion of "balance" will be more nearly maintained than a casual observation would suggest.

What holds good of a rib or cord in the warp, holds equally good when it runs across the piece; for then the warp threads would be set as closely together as possible, and the weft threads would be thick and wide apart.

In plain cloths this variation of the relations of warps and weft is optional, and may be carried to any extent to meet either the fancy of the designer or the purpose for which the cloth is being made; but in some other than plain cloths, the variation becomes a necessity if a reasonably good cloth is to be made.

Now turn to the pattern nearest to a plain cloth in the order of interweaving, viz: A three-end twill cloth, where the weft passes over two threads and under one. What are the conditions required to make a good cloth? There must be a preponderance of weft, not necessarily in bulk, but certainly in the number per inch; and the finer the weft, with proportionately increased picks, the better the result. One of the best illustrations of this is shown in a good quality of French cashmere. On the other hand, if the warp predominates on the face, the conditions should be reversed, though the reversal can never take place to the same extent, because of the difficulty of spinning warp as fine, and setting the threads as closely together as in weft.

It may be accepted as a general rule that the material which predominates on the face of a cloth should also predominate in the number of threads per inch, though not necessarily of the same bulk as that which goes to the back. A very clear and definite illustration of this general principle may

be given by reference to two well-known fabrics: Worsted "Italian" cloths used for coat linings are simply five-thread satins, with the weft predominating on the surface, and the weft is fine, with a large number of picks per inch; a smooth, even surface being obtained, with the warp practically covered. The old-time woolen "doeskin" is also a five-end satin,—exactly the same satin as the "Italian," the mere reversal of the order of the twill meaning nothing in the actual arrangement, yet the conditions are reversed. The "doeskin" is made with a good fine warp, closely set, and the weft is thrown to the back. And so it holds good of other patterns.

Three typical classes of fabrics have been taken to illustrate the general principles, and they virtually cover the ground, yet it must not be supposed there are no variations, for, as in everything else "the exception proves the rule." Then to go back to an "evenly balanced" cloth, so far as pattern goes. The simplest illustration of a possible departure from equality in warp and weft will be a common four-thread twill, where the weft passes over two and under two threads. The same rule will hold good of this as of plain cloths, that is, one material may be finer than the other, and with a proportionately increased number of threads per inch. But in the great majority of cases it will be found to be more advantageous to have the increased fineness in the weft rather than in the warp, as, for example, the French merino. What holds good of the plain cloth and the four-end twill cloth, holds good of all that may be termed plain twill cloths, or, in other words, of all patterns where the pattern is regular, and where the warp and weft come to the surface in equal quantities. But where the relations are altered, the conditions are altered.

Then, it being generally understood that when warp and weft come to the surface in equal quantites, the relations of the two may be varied, provided that an increased number compensates for the decreased bulk: attention may be directed to patterns where the conditions are different.

In so-called evenly balanced twills, the pattern runs at an angle of 45 degrees, unless altered by the relations of warp and weft to each other, but on paper they would run at that angle. Other patterns may run at either higher or lower angles. It may be taken as a general rule that when a twill runs at an angle higher than 45 degrees, the warp should predominate over the weft, and if it runs at an angle lower than 45 degrees, then the weft should predominate. But, again, there are exceptions to this rule, and it is necessary to make both the rule and exceptions clear.

FIG. 1.

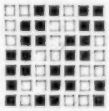


FIG. 2.

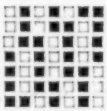


FIG. 3.

Figs. 1 and 2 are what is commonly known as Venetian twills in the woolen trade, and are the patterns of which the majority of covert cloths are made. They both run on paper at an angle of 60 degrees, therefore, following the rule just laid down, there should be a preponderance of warp over weft, either in bulk, or in the number of threads per inch. This, it must be understood, is to apply to patterns where the twill is of a "solid" character. Broken or fancy twills may upset the rule at any time. If the twills were turned warp for weft, so as to run at an angle of 30 degrees, then the weft should predominate, as the conditions would be reversed.

Now for the exceptions to the rule: Sometimes patterns, as the result of rearrangement of common twills, run at a much higher or lower angle than the original twill from which they come, or the same result may come from a combination of two twills. If the pattern is of a solid character; that is, if there is a solid twill, as in Fig. 2, the rule laid down would be

good; but if it is as in Fig. 3, which is simply a rearrangement of Fig. 2, then the rule would not be good, but must be reversed. The reason for this is not difficult to explain. In Fig. 3 there is no solid twill, but every succeeding pick is almost plain, and if thick warp, with the spaces between the threads proportionate to their bulk, were employed, there would be no definite twill; but, if, on the principle of making a ribbed plain cloth, fine warp threads closely set are used, there will be a distinct twill running at a low angle across the cloth; and the finer the warp threads, and the more closely they are set together, the more perfect the pattern will be,—on the principle that the more minute the spaces between the threads, the more perfectly they suggest to the eye a homogeneous whole.

These are the simplest suggestions that present themselves as illustrating the general principles which must be observed in cloth building, and they illustrate fairly well the rules which should be observed; and properly followed will serve as reliable guides. But it must never be forgotten that there are no rules that are not capable of some variation in their detail, at least in reference to such subjects as this, so that they must be applied with discretion and "mixed with brains."

Science and Practice of the Construction of Woven Fabrics.

FRED BRADBURY.

(Continued from August.)

Having dealt with the diameters of threads and their relative variations, it now remains to be seen what influence these have upon the construction of fabrics, in conjunction with two other main factors, viz: weave and angle of curvature.

There are two great classes of woven fabrics: I. Those which contain relatively an equal number of warp and weft threads.

II. Those which contain relatively unequal numbers of warp and weft threads.

Each of these cases may be subdivided thus: 1. Where thickness of warp and weft threads are equal. 2. Where they are unequal.

The relative number of threads in each of these classes depends principally upon the angles of curvature formed by the warp and weft threads. Those may be classed as follows:

(a) Where one set of threads lie perfectly straight while the other performs all the bending.

(b) Where both sets of threads form equal angles.

(c) Where each set of threads form unequal angles of curvature.

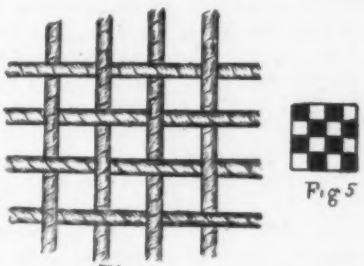


Fig 5

Fig 3

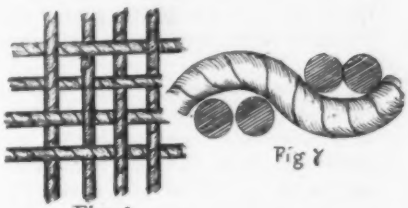


Fig 7

Fig. 6

The structure of the weave is sometimes a factor in determining to which of the great classes (I or II) a cloth belongs, though not unfrequently the same design is used in both classes, the canvas or plain weave being the most typical example.

Figures 3 and 5 represent a sectional plan. As shown in figure 3, the relative number of warp and weft threads, their diameters and angles of curvature are equal. If the angle of curvature and of compression be ignored, for the present, it will be evident that the cloth would be made up of equal threads of warp and space occupied by the weft. Thus if the diameter of the threads equals 1-60 part of an inch, the space occupied by the

warp and weft would equal 1-60 × 2, which equals 1-30, or allows 30 threads of warp per inch.

The following formula is a simplification of this principle: (No. of diameters of threads per inch × ends in one repeat of design) ÷ (ends plus intersections in one repeat of design) = ends or picks per inch in finished fabric. This method gives results sufficiently accurate for all practical purposes in all cloths woven on the 'square,' such as regular twills which do not contain as many intersections in one repeat of the pattern as there are ends in such repeat. Take for example a fabric to be made in the $\frac{2}{2}$ twill design (Figs. 6 and 7). The diameter of the warp and weft is 1-60 part of inch (2-16 worsted). The following would be a suitable number of ends and picks which the finished fabric should contain.

Applying the previous formula: (60 × 4) ÷ 6 = 40 ends or picks per inch.

Immediately we take into consideration the angle of curvature, as it is found that the number of threads of warp or weft which the fabric can naturally contain will vary with that angle.

Experimental research and experience enables the writer to conclude that the angle of curvature which the warp and weft threads form with each other is a factor of considerably more importance than appears to the casual observer. It not only modifies the number of warp or weft threads which the finished cloth must contain, but it is very important in developing certain features of many woven fabrics, both in single-plain and double-plain weaves, which will be subquently exemplified.

Writers on technical subjects have occasionally referred to it, but no one, so far as I can discover, has thoroughly explored this section of textile work, in fact hitherto it has been one of the undiscovered principles, which, though actually a necessity, in practice, has never been fully demonstrated, and consequently the trade has never got the benefit of the advantages which may result from a thorough study of the subject. We must first determine the various angles which warp and weft threads may naturally form with each other.

As an aid in determining the variations of curvature it is necessary to select a typical method of interlacing, for which purpose the "plain weave" is chosen. This is because it serves as a basis for the construction of woven fabrics in other weaves, and further, whether the texture be single, double or multiple, there is constantly a large number of woven fabrics produced, inasmuch as this weave lends itself most readily to a change of effect; in which latter the variation of angle is a prevailing characteristic.

Assuming the diameter of the warp and weft as 1-60ths of an inch each, find the correct number of ends and picks which a fabric will contain under natural conditions, i. e., when the two sets of threads are as close to each other as their diameters and angles will permit. This is illustrated at Fig. 8, which is a section through the warp. In this case each set of threads forms equal angles. A consideration of the figure shows that the angle formed by the weft at any point of intersection is a continuously changing one. A straight line drawn through the centre of the weft thread at "B," its lowest position on the underside of the fabric, and through "D," its highest position, on the upper side, distinctly demonstrates that the average angle formed by the weft with the horizontal is one of 30 degrees, and consequently the angle of the warp will be 30 degrees, since they each form equal angles. I have known such an angle (Fig. 8) to be expressed as one of 60 degrees but I would point out that it is not possible to construct a fabric where the warp and weft shall each form angles of more than 30 degrees in single-make textures, and since in double and compound fabrics it is always advisable to construct the cloth upon the principal ground texture, the angles formed by the warp and weft will not exceed 30 degrees excepting at those places where warp or weft passes from one fabric to the other, either for binding or figuring purposes.

(To be continued.)

Worsted Yarns.

In this article I intend to devote myself almost exclusively to the drawing and spinning departments of worsted yarns. I shall aim to be as concise and brief as possible in presenting to you readers some of the leading calculations of a practical nature and every-day use; to make the subject better understood, and to be intelligently followed, we will suppose the tops received for the drawing are of even length, free from twits and slubs, and the size of yarns to run up to 70s. In calculating for the drafts of each machine, in order to bring down a given weight of top to the required weight in roving, beginning at either end to obtain a desired result at the other, the rule is to multiply the weight by the draft, and divide by the number of ends at the back of the box. That is, when making the calculation backwards from the roving, if taken from the can box forwards, the rule is to multiply by the ends and divide by the drafts. The former method is the better one, because, according to the counts of yarn wanted, the desired weight of roving can be at once determined, and therefore it is necessary to find the weight of the sliver, delivered from the front of the first can gill. We will suppose that we want to bring down the sliver to weigh at front of roving box 1.6 drams, each 40 yards. Proceeding backwards with the following ends up at the back of each box, 2, 2, 2, 3, 4, 4, 5, 3:

1.6 drams (weight 40 yards roving) × 6¼ (draft of roving box) = 10 ÷ 2 (ends of roving) = 5 (drams weight of reducers; 5 × 6 (draft of reducers) = 30 ÷ 2 (ends of reducers) = 15 drams, weight of small finishers.

15 × 6 (draft of small finishers) = 90 ÷ 2 (ends of small finishers) = 45 (drams of large finishers).

40 × 5.6 (draft of large finisher) = 252 ÷ 3 (the ends) = 84 drams weigh box.

Then, if 40 yards at weigh box weigh 84 drams, how many will it require to the number of pounds wanted to put on one w. b. bobbin, supposing 6 pounds net is required. For example:

256 (drams in one pound) × 6 × 40 = 61,440 ÷ 84 = 731.4 yards.

If the knocker-off gauge number be 27,960, this divided by the yards (731.4) will give the change wheel on knocker-off. Thus: 27,960 ÷ 731.4 = 38.22, change wheel. As the wheel must have a full complement of teeth, the nearest will be a 38. This wheel on knocker-off will give a fraction short of 736 yards, being a little over four yards on a bobbin more than the calculation calls for. This in weight would be about half an ounce in a full bobbin of 6 pounds. So it will be seen, as the calculation stands, it is practically correct. The next operations are taken in the same way. The next box is the weigh box. Proceeding backwards to the can gill box:

84 (drams, weight from w. b.) × 5.4 (draft) = 453.6 ÷ 4 (ends at w. b.) = 113.4 (drams, weight second drawing), and this × 5.4 (draft) = 612.36 ÷ 4 (ends, second drawing) = 153.9 (drams, first drawing), and this × 5¾ (draft) = 884.9 ÷ 5 (ends up) = 177 (drams, spindle gill); and this × 5 (draft) = 885 ÷ 3 (ends up) = 295 drams, off front of first can gill.

If 40 yards weigh 295 drams, how many will it require to the number of pounds wanted to put in one side of the can? The cans to hold 15 pounds; this will be 7½ each side net.

256 × 7½ × 40 = 76,400 ÷ 295 = 260 yards.

Then, if the knocker-off gauge point be 7, this divided into the number of yards required knocked off, will give the change wheel. For example: 260 ÷ 7 = 37, change wheel required.

There are several points to watch during the process of drawing. Even piecings will tend to keep the stock from being delivered by the back rollers in lumps. Ends put up doubled will bend the pins over; and the damaged pins catching the leathers, cause a smash, sometimes, besides breaking

the fallers or cam, if they chance to be a little weak. The saddles on which the fallers rest, while they travel to and fro, need frequent attention, as they are liable to wear short. They should be long enough to let the fallers drop and rise almost perpendicularly. To ensure this, the saddle ends should be straight, with the upper part slightly shaved off, and case-hardened, so as to last well. As faller pins wear out quickly, it is important that they be kept in good repair. Some wools more than others, resist the rise of the fallers. Such resistance causes the pin points to split, which makes the wool to ride on the top; and when it comes to be drawn out by the front rollers it breaks, being held by the roughness of the pins.

When the leathers begin to show signs of getting done, that is, if the splices are giving way or if they have worked into thin places, take them off at once, and in putting on new ones observe the following: Select two leathers as near alike as you can get them in thickness. If one is thick and one thin, the latter will deliver more slubbing than the former. In starting new leathers, let them run a short time with scarcely any weight on, until they get properly fluted. Be careful in putting on leathers, to put them on the right way; the splice inside to lead on first round the wood roller. If on reverse, the splice will be ripped open. When the calender rolls are not drawing the wool in fast enough, put a smaller wheel on. Should you not have one, alter the front roller one tooth larger, and the calender wheel one tooth larger, because the front roller wheel makes it go as fast again. The nearer the back rollers are put to the fallers, the better the wool will get into them. When the fallers are lapping, the front rollers want putting nearer to the fallers. The best test is to feel the wool, and if it is evidently stretched very tight, the back rollers should be put back a little. If too slack and not getting into the fallers, they should come forward.

To obtain a correct knowledge of the method of calculating the different effects of machinery, it is necessary to have a perfect understanding of the relative connections which one part of the machinery has with another. Care should be exercised when taking the drafts of drawing or spinning frames, that all wheels which, with an increase in their dimensions, produce an increase in the speed of the back roller without altering the speed of the front roller, are drivers; and those producing the opposite effect are drivens. There are intermediate wheels, both drivers and drivens. They communicate as much power and speed as they receive; their function being merely to transmit motion, and are not taken into consideration in making calculation. We will take the draft of the small finishers. The first driver which derives its power from the twine wheels is the front roller, which is 3 inches in diameter, the others being the inside stud (100), and back roller wheel (84). The first driven is the change wheel on front roller (34); the second, the outside stud or plate wheel (62); the last diameter of back roller being 2 inches. The draft would be as follows:

$$\frac{3\times 100\times 84}{2\times 34\times 62}=6 \text{ draft.}$$

By leaving out the change wheel (34), the standard, or what is called gauge point, can be obtained, which will be found to be 203. Draft (6), divided into this number will give change wheel required, namely, 34, nearly. Long and sound wool will stand more draft than short and tender wool.

According to the qualities of tops on hand, particular attention should be given to obtaining suitable drafts. Excessive drafts will make uneven yarns. The more doublings there are, the more level the yarn will be.

To ascertain the total or separate effect of drawing from the first box to the roving, including all the respective drafts and doublings, having the weight of 40 yards of drawing from the first box:

Multiply the weight of the given drawing by the number of ends put up at each box. Then multiply all the drafts together, divide the former

product by the latter, and the quotient will be the weight of 40 yards of roving. Particular care should be taken that the ratches be set to the proper length, according to the stock in progress. THE OLD MAN.

A Three-ply Plain Weave.

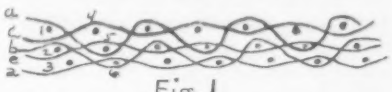
MULTIPLE FABRICS.

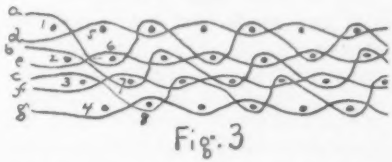
We have received an inquiry from a subscriber in New York State, who desires a design for a three-ply cloth, plain weave. In order to give our subscriber the best talent obtainable concerning this weave, we have requested Thomas R. Ashenhurst to supply the necessary information, as it covers a rather interesting subject, in which there will be a more or less general interest. Mr. Ashenhurst is recognized in this country, as well as in England, as the highest authority on anything relating to the construction of fabrics. Mr. Ashenhurst says:

There is probably nothing which gives more trouble to the designer or manufacturer who has not made a systematic study of the building of fabrics, than the construction of three-ply, four-ply, or rather multiple fabrics; yet they are as easily dealt with as any other, if a proper system be followed. There is probably more difficulty in making a double plain cloth than any other double cloth, because of the binding of one cloth to the other without that binding being visible on either or both sides of the fabric. But with three, four, or any other number of cloths bound together, this difficulty disappears, simply because the weft can be made common to any two cloths. When, however, any other than plain cloths, twills for example, are required, any number of cloths may be woven together to make one fabric with ease.

Examine first a three-ply, plain cloth,—that is, three perfectly plain fabrics woven together and in such manner as to form one solid compact fabric, a section of which is shown at Fig. 1.

In this, there are three plain cloths, the upper one formed on one warp with the weft threads "a c" interweaving with it; the middle one with the weft threads "a b" and "c" interweaving, and the lower one with the weft threads "b" and "d" interweaving so that in each case one of the weft threads forming each fabric is common to two cloths, as "a" and "b," and each cloth has one to itself in addition. This is undoubtedly the most perfect method of making multiple plain fabrics, because each one has the same structure and all are equally balanced in their parts; and it also follows that if a three-ply cloth can be made on this basis that any multiple cloth can be made on the same principle.





One of the most perplexing problems is how to make the weaving drafts for such cloths. This is quite easy if an intelligent system is followed. Now take the warp threads as numbered, 1, 2, 3, 4, 5, 6. Then take the weft threads in succession, and mark the warp under which each passes as follows: "a" passes over 1, 2 and 3, and under 4 and 5; "b" passes under 1, over 2 and 3, and under 4, 5, and 6; "c" passes under 1, and over 2, 3, 4, 5 and 6; "d" passes under 1, 2, 3, 4, 5, and over 6, and "e" passes under 1, 2,

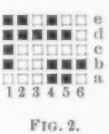


FIG. 2.

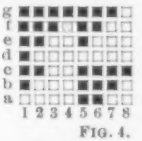


FIG. 4.

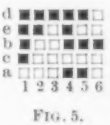


FIG. 5.

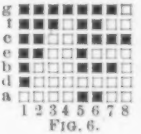


FIG. 6.

over 3, under 4, and over 5 and 6, as shown in the draft at Fig. 2. Consequently each thread falls into its exact place to form the fabric and the rest of the threads are simply repetitions of those first six.

A four-ply plain cloth on the same principle is shown in section at Fig. 3. "a b" and "c", are the three picks common to two cloths, and "d, e, f, g" are these which interweave with the warp of thin cloth only. The weaving weft is shown at Fig. 4, made in exactly the same method as Fig. 3.

It may not be policy to weave the cloth with the picks in the order of succession shown here; this method is adopted simply to show the analysis—the separation of the picks which are common to two cloths, from those which interweave with one warp only. For Fig. 1 it would be better for them to follow in the order "a, c, b, e, d," which is, what might be termed, the natural order of succession, then the draft would be at Fig. 5; and for Fig. 3, as shown at Fig 6, where the picks are in the order "a, d, b, e, c, f, g."

It is quite as easy to make five, six or any number of plies, as it is to make three or four, and each perfectly plain; and by numbering the threads as is done here the weaving draft is readily made out and with very little risk of error.

There are other methods of building multiple cloths where tensile strength accompanied by comparative lightness of cloth can be attained, but the structure is not quite so perfect as by this method.

Out of the Procession.

COLORING WOOLEN WASTE.

We were in a mill the other day which has since "shut down for repairs," according to the virtuous practice of some concerns, in which no repairs are made save such as stern necessity secures, in order to keep things from absolutely going altogether to smash. This mill seemed such an anomaly in the trade these jarring days, that we must relieve our feelings by reference to it in a line or two. I recognized an air of languor and shiftlessness about the whole place that I could not account for.

The dyer (with whom I have been long intimately acquainted) seemed to be most distressed with the condition of affairs; and it is on behalf of the class he represents that I now write. From him and others, as well as from ocular demonstration, I learned during the time I was there that loafing was the routine from attic to basement; and such was the effect upon their help in general that after determined efforts on the part of our dyeing friend and one other overseer to make their departments "hum" in the way they have always been accustomed to elsewhere, and to "keep the boys on the move," as he himself expressed it, that finally they both succumbed to the inevitable, giving themselves up to the prevailing spirit of lethargy until they could better themselves.

Happening to be around on a succeeding day, between eight and nine in the morning, and in a room of the mill facing the front yard, the enigma solved itself to me. The superintendent was just entering to begin his duties of the day; and though gossipping groups here and there broke up, and political newspapers were put away with some sense of decency as he came in, and bosses and help began to exhibit disgusting industry along the route of his morning's inspection, a glance at the listless, shambling figure of the man indicated the source of all this rottenness. All the energy he ever had been known to exhibit, the dyer assured me, was in the direction of his temper, which was at times uncontrollable. He was utterly innocent of enthusiasm or enterprise. Like many another manager, he was addicted to daily prevarications and secrecy, amounting to a perennial course of unchecked non-veracity and deceit. Now that has always been something in a superintendent that touched me to the quick myself; so I could sympathize. He was full of suave promises that ever fell short of fulfillment.

The point that specially exasperated the dyer, however, was that he might order supplies, and re-order them, and wait weeks and weeks before they came to hand; then, very often, they would turn out to be something entirely different from what was needed. Dyes would turn up in quantities diminutive, expensive, and wholly inadequate right along. At other times between, unnecessarily large lots of sometimes unsuitable and uncalled-for stuffs would land in on him, for which he had real difficulty in finding any use whatever. "Jack," I remarked on leaving, "things are not booming here, anyway." "No," he returned grimly; "guess not. We're not in it at all,"—which was of course a patent fact.

It is because this sketch is not a strictly solitary illustration from life, that I place it here for reverie and for warning. Give the dyer a chance.

Mills that are making a really superior class of goods, commonly desire to use up their own waste, deeming that it is not overtaxing possibilities to expect good stock to carry its own leavings throughout. In the present condition of trade this can usually be done without bother; but there are a small proportion of factories which decide against its return to the cards, principally, if not solely, on account of the oftimes inordinate amount of dirt that goes with it, causing trouble in the carding and wet finishing processes. This is further exaggerated when the wastes are dyed in the common way, because chemicals and dyes, with alternations of boiling and cold water, all tend to set and render more gummy and grimy the mixture of dust and oil already in the stock. There is a means by which with but trifling additional expense, comparatively, this may be entirely obviated; and these products be furnished almost, if not quite, as clean and open in condition as pure stock. From my own working experience of many years with such material, I will give some hints as to securing this desirable result.

In the first place, I contend that the wastes, both hard and soft, should first be graded as to colors, quality of wool (if there is much diversity and pronounced extremes), and frequently as to degree of dirtiness.

Much can be saved in staple and in cost when this essential preliminary is attended to. Many mills foolishly neglect all this; nor do they thank you for advising them to the contrary. Well, I shall pass that by. Where we can't agree, we shall agree to differ, or at least to refrain from wrangling. "As much as lieth in you," saith the Book, "live at peace with all men."

When ready to proceed,—say, with soft, or card-room waste, two methods are open. If it is to be worked up with fresh stock into yarn for piece dyes, such as serges, meltons, etc., I have found it an excellent plan to mix it with the unscoured wool in desired amount on the floor of the wool scouring room; and to proceed exactly as though you were scouring only the wool.

Suppose you wish to put through a four-hundred-pound lot, containing twenty-five per cent. of card waste, then discover the shrinkage by washing of both wool and waste separately.

This done, add waste enough to make one hundred pounds (clean) of it, with wool enough to fetch three hundred pounds (clean) of that; and go ahead.

A two-or-three bowl washing machine makes the best job of this sort of thing. In the first bowl prepare a strong hot bath of alkali, 58 per cent., with or without a small addition of soap solution. In the second compartment you will need a nice, free, warm, soap bath, with or without soda ash, and containing a trifle of aqua ammonia to help get rid of the foul oil and odor. It is preferable to use nothing but warm water to rinse in after scouring.

If the waste is for dyeing before spinning, scour it as above, except that you will not likely require so much soda ash in the first bowl, since there will be no wool mixed in along with it. Do not rinse this in cold water on any account. I much prefer letting it go through unrinsed altogether, if that be the only alternative.

If you can have it rinsed in warm water, by all means do so. All hands know that it is highly important to secure by every precaution that it be kept as open and soft as possible. It is now ready for the kettles.

Proceed as for wool proper, only strip the color down as much as you can in the chrome kettle, and in dyeing allow, of course, for the shade remaining as a "bottom" after "preparation." For ordinary purposes a simple mordant of bichromate of potash (two per cent.) and sulphuric acid (one and one-half per cent.), without argols or anything else, is hard to excel on this class of work. It strips well, works evenly, and is cheap. If the kettle is carefully boiled, it leaves the waste in nice condition, and keeps you on friendly terms with the carder. My readers are doubtless well aware of the stripping properties of both constituents of this mordant; not all, perhaps, have looked into the reason for their action separately or combined.

Referring back to the formula of bichromate of potash (see June issue) you will see that it is made up in its molecular construction of two atoms of potassium, two of the metal chromium, and seven of the vitalizing, yet phenomenally destructive gas, oxygen.

In a similar manner sulphuric acid, in its molecular constitution, is built of two atoms of hydrogen gas, and one of sulphur, with four of oxygen. Note, then, how largely oxygen enters into the composition of these chemicals. In this lies principally the secret of their power. It is their powerful oxidizing properties that, in the "chrome kettle," render them capable of extracting or destroying so much of the already fixed color on the multicolored "all nations' waste" that comes into the woolen mill dye room at irregular intervals through the year. Finish in a second kettle in the ordinary way, taking care to boil gently. Dry without superabundance of heat, and you will have a dyed waste that will rejoice the mind of carder, finisher and superintendent alike.

If you are working "hard" waste, whether yarn or fabric, proceed in about the same style. Why, you say, do I actually advise you to scour it? Yes, indeed; if you would make a nice, clean, first-class article for fine goods, it will pay you to scour it. How shall you scour that endless tangle of yarn? you ask me. Get a block of hard pine, a broad-axe or a butcher's cleaver, and a boy; set them together at work chopping up the stuff short enough to handle without trouble. Next run it through the washing machine,—(none of your fun; I don't mean the cloth washer), prepare and color it, and dry, as in the case of the soft waste I have already described. I know that hard waste is almost invariably put through without scouring, yet, as I said before, if you want it in good order for a fine make of goods, it will be to your interest to handle it somewhat as I have directed. You can tell the difference even on the wool drier, for the hard waste that has first been scoured dries ever so much more readily and rapidly, owing to being open and clean. Try for yourself, and see if what I say is not so. "The proof of the pudding is in the eating of it," still.

J. C.

Worsted Combing.

As a result of the action of the card wires, the sliver at this stage contains a large number of neps, small vegetable impurities and short fibres, all of which must be removed before we attempt the formation of the thread. The fibres themselves have no definite arrangement, but are crossed and intermingled in every direction. This intermingling is to a great extent overcome by the gilling which follows backwashing, in order to prepare the wool for the next process of combing. Seeing that the ends are composed of all classes of fibres—long, short, curly and straight,—some method must be adopted to get rid of those which cannot be utilized. We have now, therefore, to separate the wool into two portions. One of these, termed the "top," consists of all the fibres which are of sufficient length to enable them

to be used in making the thread; the remainder, known as noil, is composed of fibres too short to be used, neps, shives, etc. During the process of combing, many of the neps get opened out or much reduced, owing to the longest fibres being drawn away from them.

The relation between the amount of top and noil produced is expressed as the tare of the wool. For instance, a wool that is yielding 7 pounds of top to 1 pound of noil is said to be taring 7 to 1; if making 3 of top to 1 of noil, then it is taring 3 to 1, and so on. This is the basis upon which the commission comber formulates his scale of charges, wool with a high tarage being the most difficult to comb. The present charges for wools giving 7 pounds and upwards of top to 1 of noil, or about 2d.; 3 to 1, 2¼d.; under 2 to 1, 2¾d.

The aim of the worsted spinner is to obtain as much top from his wool as he possibly can, since the noil is of no use to him, and has to be sold to the woolen spinner, who converts it into a different class of fabric. It is essential, therefore, that we should guard against everything which tends to increase its quantity. The soundness and general character of the raw material form a very important factor in this respect, since we often find a wool which in the grease measures, perhaps, 6 to 6½ inches in length, and yields a top of 5 or 5½ inches, or may be even shorter. A portion of this decrease is due to the shrinkage which results from scouring; but most of it arises from breakage, caused very probably by some inherent weakness in the fibre itself. The strength and tenacity of the staple should be very carefully examined and tested, because wools are frequently found which readily break about ¾ inch from the tip. Defects of this kind are of great consequence, since the strength of the finished thread is primarily dependent upon the length of the fibres being preserved. All other things being equal—fineness, softness, soundness, etc.,—the top with the longest wool is by far the most valuable. A short top requires more twist in the spinning and preceding operations of the drawing to enable it to work properly; this of course reduces the quantity of work turned off, and hence results in a material loss.

So far as our investigations into this question have proceeded, we are led to believe that a frequent cause of the mischief lies in the injurious influence which the substances composing the "dips" and "smears" used by the wool grower exert upon the fibre. They appear to act on the tissues, and completely change their physical properties, making them dry, tender, and devoid of elasticity at that particular place, and rendering them unable to resist a longitudinal strain. This is only another illustration of the fact that many times in its growth and the earlier stages of manufacture, it is treated with substances which are prejudicial to the succeeding operations. What is wanted is a better understanding of the requirements of each process by all those concerned in the production and manipulation of wool. The prevalent practice of branding with tar should also be discontinued, since it causes the fibres to adhere, and the lumps have to be removed by the sorter with his shears, the result being that a number of short bits are left in the fleece. Weakness of the fibre may arise from other causes, such as the sheep being unhealthy, or from not having sufficient food and nourishment, or by exposure to extreme variations of weather; but in these cases, the faulty places are generally found at intervals throughout the length, and hence the fibres break into several pieces.

Burrs and other fruits with hooked spines and hairs tend to increase the quantity of short fibres by causing the wool to become much entangled and difficult to separate, without considerable injury. We must also add as an accessory, the breaking which takes place in the preparatory stages of working at each operation, and particularly when through some cause or other the fibres have become badly felted. All of these are contributory

causes which assist in producing the noil; but most of them can in a great measure be obviated by care and attention on the part of those who superintend those stages where they begin. They arise principally through ignorance or indifference to the fundamental requirements of worsted spinning, and so long as each endeavors to serve only his own interests we must expect them to occur.

The object of combing is not, as some writers affirm, to remove all the serrations from the surface of the fibre, so as to prevent felting taking place when it is woven into cloth, but to effect the separation we have indicated as being necessary, and to impart to those fibres which are capable of being utilized a strictly parallel arrangement We then secure two of the fundamental features necesary for the production of sound yarn—viz., filaments of a good length, the whole of which are available, to enable them to be readily twisted around each other, so as to give the most strength to the strand into which they enter. We have before insisted upon the preservation of the exterior of the fibre, and in order to prevent as much as posible what we have just mentioned actually occurring—stripping the fibres—those parts of the machines immediately engaged in dealing with the wool in detail are heated by means of gas or steam.

Combing is accomplished by drawing the fibres between a number of closely-set pins, which are arranged either in circles or as fallers. The fineness of the pins and their setting varies according to the character of the wool. Where a number of rows are used the pitch is made progressively finer as they approach the outer or inner edge of the circle, as the case may be; and, in some instances, flat pins are used in order to obtain as much combing surface as possible, to prevent any neps passing into the top. It is sometimes urged that it is a great mistake to have the pins set too fine, because, in the first instance, they are of necessity unable to bear much strain, and the foundation is weakened, owing to the large number of holes which have to be drilled in it in very close proximity to each other. If coarser pins were used, it is argued that no combing surface would be lost, since they could be placed quite near without much injury to the brass in which they are fixed. We do not quite agree with this, because in the first instance, in an ideal system of combing, each fibre should be dealt with separately, and it follows that this will be more nearly approached when we have the greatest number of pins, with their corresponding interspaces. When thick pins are employed, they may be set close together, but the number of spaces are fewer, and consequently more fibres are placed in each. To make this more clear, let us take an example: Assume that in a fine set circle we have 2000 spaces. If fully utilized, these will carry and comb the same number of fibres; decrease them now by one-half, then while it may still take 2000 fibres, there will be two in each division, where previously we had only one. Under these circumstances it will be evident that the combing and clearing will not be as perfect as before.

Now, the essential requirements of a top, so far as the machines are concerned, are that all its fibres must be strictly parallel and clear, free from neps and slubs, while the end must be perfectly regular. This is obviously impossible in every case, because the diameter of the fibre is very much less than the distance which separates the pins, and consequently they are not dealt with singly, but in numbers. The finer we can get both the pins and their setting, the nearer we shall approach to the ideal top.

It is absolutely necessary that the circles should be kept clean and free from any solid impurities, which, when they accumulate, hold the pins apart, and thus allow the small neps to pass forward. Many automatic cleaners have been devised, but probably the most successful is that of Messrs. Greenwood and Farrar's, which consists of a small circular brush held in position by a spring. It

receives its motion from the circles, and the bristles penetrate between the pins, removing anything which may have lodged there. Attention must also be paid to the condition of the circles or fallers concerned in the combing. If the pins get bent or broken out, especially in the inner rows of the large or outer rows of the small circles in the Noble comb, they will materially affect the character of the work, for it is these upon which we depend for a clear sliver, and if they get damaged there is nothing to collect the neps, etc. Their points must be sharp, free from grooves and hooks, so that the fibres may be dabbed well into the circle or fallers. A clean, smooth, and well-polished pin is also a desideratum which must not be overlooked, for if rough or rusty it acts as a rasp, injuring the outside of the fibres as they are drawn against it. Two kinds of pins are employed—round and flat; the latter, being generally regarded as the best combers, are used where the greatest amount of separation and retention is required, as, for example, in the fallers of the Lister comb and parts of the circles in the Noble comb.

The operation of combing may be conveniently divided into four stages, which are successive but not always continuous: 1st, we have the feeding of the wool; 2nd, its partial combing; 3rd, combing, completed by drawing off the longest fibres to form the top; and 4th, the removal of the noil. These may be readily distinguished in the various machines, though accomplished somewhat differently. Four types of combs are in general use: The Noble or circular comb, which may be conveniently used for a very wide range of wools; the Lister or nip comb specially adapted for dealing with the long lustre wools, such as Lincoln, Romney Marsh and Mohair; the Holden or square motion comb, largely used for short merino wools; and Little and Eastwood's comb, also for short-stapled wools up to 6 or 7 in. long. The first of these is very largely adopted by most combers because of the facility with which it can be altered for dealing with either Botany or crossbred wool. It owes its origin to the labors of Messrs. Noble and Donisthorpe, and consists essentially of three circles—one large and two small ones—which revolve in the same direction and have on their upper surfaces concentric rows of pins. Combing is accomplished by pressing the wool into the pins of both circles at the point where they approach nearest to each other. As they revolve and separate, the wool becomes divided into two portions, and we have projecting from each circle a fringe of partially combed and straightened fibres, which are removed and combined to form the top. This is briefly the principle of its action; but it calls into operation a series of complicated contrivances.—[M. M. Buckley in Textile Manufacturer.

Low Grade Trouserings.

There is more false economy in manufacturing processes than in any other industry. It is so easy to make an apparent saving in one particular, and so hard to see how the saving actually leads to additional expense and labor. The class of trouser goods to which we refer in this letter is of this kind. There is a low grade line of cloths commonly known as Hair-lines, which are always a staple article, and always command a market. But the idea is abroad that any class of wool can be put into them with equally satisfactory results.

The make-up of the goods is a part cotton and part wool warp, and an all-wool filling. The fact is, however, that the all-wool filling is mainly so in name only. The proportion of wool actually present runs as low as 20 per cent., and occasionally lower still.

The fabric is undoubtedly a cheap one, and the low figure at which it is produced necessitates a careful attendance to the process at every step. It is this low figure which is undoubtedly to blame for the poor, cheap stock that gets into the cloth, to the despair of the finisher and other operators alike. Many mills use pulled

wools in their hair-line yarns. This is unquestionably a cheap wool, but at the same time it seems to possess some kind of properties that are extremely difficult and expensive to handle in the manufacturing processes. Pulled wools always have a large number of wool specks present in their make-up, and the removal of them is no easy matter. It calls for additional expense in the specking room, and more radical work on the cards. But the desirable feel which is so necessary in a woolen fabric, is always impaired by the use of pulled wool, by reason of the traces of lime which remain in it. It seems absolutely impossible to get out a wool of this kind with the feel and appearance which we want, and yet keep within the limit as to expense and value.

There are other wools, little more costly than the pulled variety, which, though more expensive at the start, lead to much better results, and make it possible to do good and satisfactory work. Take a medium territory or Texas wool, and it will cost but little more, and will enable us to get along without the wear and tear on machinery, and the extra time and expense of labor, and in the end it will turn out a cloth more useful and more satisfactory in every respect. And, indeed, it is a question whether in the long run, all things considered, the expense of production is very much more than with the inferior grades so commonly employed.

The most important processes in the handling of these goods, we are almost persuaded to state, are the burling and darning. The peculiar regularity of pattern, and the juxtaposition of such contrasting colors, always make care at these two operations an absolute necessity. A misplaced thread, or a knot or spot, on the face shows up very clearly, and condemns the goods at once whenever it appears.

At the mills, we have to protect the face by tacking the selvages together, and as cotton warp is the word, we do not need to use the traps in fulling. The length of time required to full is considerable. This is on account of the cotton that is present in such large proportions. To save time just at this stage,—and time enters very largely into the expense of finishing, so that if it is possible to save time at all, it is well to do so,—we often double or treble the cotton mix hair-line in the mill. This operation may cause trouble if it is not properly done; but when it is correctly managed, it leads to good results.

In running pieces double at the mill, the most natural procedure would be to take two pieces and run them in together. This seems quite plausible, but it is really unsatisfactory, unless we happen to have two pieces of the same length and of the same weight per yard, and requiring the same treatment in the mills. This is the only condition that will admit of our using two pieces in such a way. The possibility of getting pieces in such shape is almost out of the question. It is found to be far more practical, therefore, to double the one piece. This is done by running the piece twice round the mill.

This can be done with perfect ease and satisfaction. The piece is first taken and measured, then at the one-half point, a string is tied round it. The end of the piece is then run into the mill and the piece is wound round the rollers till it comes to the middle string. Then the end that has already gone through is taken and tied at the middle point and run round again, and finally the two ends are sewed together.

The result is two pieces in the mill, each exactly half the length of the whole, and they will run quite perfectly, because all conditions are exactly alike. With the pieces doubled, or trebled, which latter is managed in the same manner as the former, the piece being divided into thirds instead of halves, the work of fulling is just done in one-half or one-third the time that would otherwise be required. The soap used must not be so strong as to attack the colors, and this will mean more in these goods than with many, for in these cheap, low grades, colors are often not what they should

be. If it is added in the right quantity, and of sufficient body, there will be no more need of soap when the goods are in the scouring process. The water in washing is warm, but not immoderately so,—about 100° being the right thing. Run well in this, with two or three changes of clean water; and then rinse in cold water. A bucket of salt water in the washer before the goods are removed is helpful to colors and their brilliancy. Gig, steam brush, shear and press, and the operation is about complete.

The most important points are the fulling, shearing and gigging. If these items are carefully attended to, the finish ought to be all that could be wished. MANUFACTURER.

Ohio Wool Growers.

The Ohio Wool Growers' Association had a meeting recently, and adopted resolutions endorsing the wool schedule of the Dingley tariff. Judge William Lawrence presided, but his extreme views concerning the tariff on wool were not incorporated in the resolutions that were adopted by the convention. The Judge, however, is too good a protectionist and Republican to act contrary to any set of resolutions that endorse the imposition of a tariff on wool. The views of the convention, as expressed in the resolutions adopted by it, favor a protective tariff as "of the highest possible importance to that most widely extended agricultural industry, the growing of sheep and wool; and while we do not regard the wool schedule in the tariff act recently passed by congress as all that could be desired for the American farmer, yet in view of the terribly disastrous results to the sheep and wool industry of the country from the free-trade legislation prevailing for the previous four years, we welcome the tariff schedule of the Dingley law applying to this country, as an inestimable boon, giving hope and promise of a revival of the industry, and certainly saving it from the annihilation to which it was fast rushing under free-trade legislation."

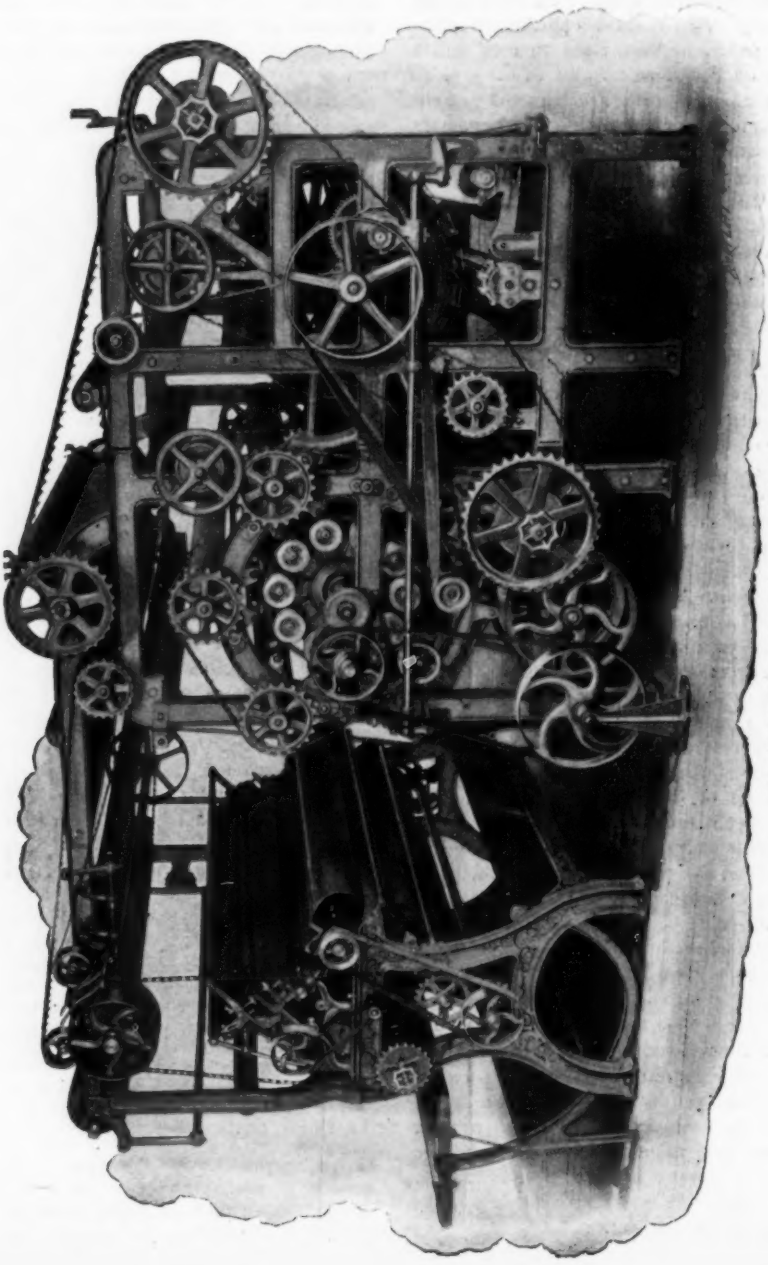
The resolutions declare that all wool growers of the State are ready to stand by the Dingley tariff, and by the men through whose influence and votes it was enacted. There was a formal declaration in favor of the organization of a department for instruction in textile industries in the Ohio State University, and the governor was requested to make recommendations, accordingly, in his next message to the General Assembly.

The Canadian Tariff.

The new Canadian tariff, which has just been published by the Customs Department, Ottawa, contains many points of interest relating to textile manufactures. The text of the tariff has just been received by us, from which we observe that a duty of 25 per cent. is imposed upon cotton fabrics, white or gray, bleached or unbleached, and 35 per cent. on those printed, dyed, or colored. Embroideries, laces, braids, and the like, bear a duty of 35 per cent. A duty of 25 per cent. is placed upon women's and children's dress goods, coat linings, Italian cloths, cashmeres and similar fabrics, composed wholly, or in part, of wool, worsted, the hair of the camel, alpaca, goat, or like animal, not exceeding in weight six ounces to the square yard, when imported in the gray or unfinished state, for the purpose of being dyed or finished in Canada. Knit goods have a rate of 35 per cent. Wools are allowed to come in free of duty, with the exception of lustre or combing wools, such as are grown in Canada, embracing the Leicester, Cotswold, Lincolnshire and Southdown combing wools, which have a duty placed upon them of three cents per pound. This duty is evidently imposed for the purpose of protecting the Canadian growth of these wools. Worsted tops made from such wools as are dutiable bear a rate of 15 per cent., and woolen and worsted yarns 20 per cent., though such yarns costing thirty cents per pound and over, when imported on the cop or tube, or in the hank by manufacturers of woolen goods, for use in their products, are allowed to come in at the rate of 20 per cent.

Cropping and Gigging Combined.

The process of finishing goods like beavers, kerseys, carriage and casket cloths, etc., involves a great deal of teaseling and shearing; these operations being alternated many times in highly finished goods. It has been the common practice, after the preliminary gigging, in which the nap has been well started up to that point where the teasels can no longer work



CROPPING AND GIGGING MACHINE.

to their full advantage, to transfer the pieces to the cropping shear. Two or three runs are here given them to cut off the top of the nap, so that they may again be put on the gigs to advantage.

This process is repeated many times. The heavy wet pieces are folded off onto trucks to be carried to the shears, only to be refolded off to be returned to the gigs. This carrying back and forth of the cloth, with the attendant loss of time, together with the time taken up in running and re-running the pieces on to the gigs and shears, and the resetting of these machines for the different pieces, involve great expense. The loss is not alone in the labor expended, but also in the prevention of a rapid and continuous movement of the cloth towards its final destination.

The combination napper gig and shear, here illustrated, is a machine that has completely overcome these difficulties. It is in no way an experimental machine, for the builders have had several of them running for the past two years in some of the most prominent mills of the country. They have given perfect results, with a great saving in time and labor.

This machine consists of a regular cloth-shearing machine, a planetary napper and a teaseling gig cylinder, combined in one machine. The cloth is first run on to the napping cylinder, where the wire starts the nap and softens up the face of the goods, so that the teasels will do their work quicker and still give the effect that teasels alone will accomplish. The wire napping thus given the cloth on every run before it strikes the teasels will make the teasels last much longer, and at the same time give the required finish much quicker.

One or two runs on the napping and teaseling cylinders will make it ready for the cropping shear. To use the shear, one merely has to let down the blades on to the goods, for the pieces are strung through the whole combination when first run into the machine. From four to six runs with the shear, napper and gig running together, will generally be sufficient, for the shear takes off the ragged top nap and enables the napper and gig to do their work much more effectively and quickly. A run or two on the shear alone will then complete the operations and leave the goods as they ordinarily come from their final run on the cropping shears.

This gives much more even results, because three operations are practically combined in one operation and under the care of one man, for one man will run the whole machine. Another point tending to uniformity in finish, is the large number of pieces that can be put on the combined machine and handled at the same time.

All the levers and handles are within easy reach, and one man can run the combination as easily as he could any one of the three machines forming it.

The shear is built with stationary or list-saving rest, as desired.

It is manufactured by the Parks & Woolson Machine Co., of Springfield, Vt., and the cost of it is such that mills manufacturing certain classes of goods cannot afford to be without it.

The manufacturers will gladly send cuts and full particulars to all inquirers, whether they contemplate purchasing or not.

Manufacturers' Waste.

There is a scheme contemplated of a sewerage system for conducting waste from the woolen factories at Olneyville, R. I., to some central place for treatment for the restoration of valuable products that may be therein. The city of Providence has taken some action in regard to this, and is making arrangements with Henry McDowell, of New York, to take care of this waste without expense to the city. In order that the scheme may be carried out, it becomes important that all of the mills in that neighborhood shall become parties to it; and for this purpose, all have signed the agreement to run their waste into a common sewer, with the exception of two, the Atlantic and Riverside. At pres-

ent writing these two mills have not entered into the agreement and, unless they do, we are given to understand, the matter will fall through. Mr. McDowell's plans, he writes us, are not quite complete, and some are being protected by caveats. The manufacturers in interest have nothing to do with the scheme, only that they have agreed, with the two exceptions, to turn their waste into a pipe line to be provided by the city. It is not exactly known what the contractors propose to do with the material that they collect, but it is looked upon by some of the manufacturers that we have approached, that it is a scheme which promises but little profit, as the deposits of dye-water and wool washings will be all mixed together, and their separation will be a matter of some difficulty. However, the contractor may know his business, and he has yet to reveal the details of it, any further than that he is to bear all of the expense connected with it. The system of sewers required for carrying the mill wastes to a common centre, where a factory will be located for the treatment of the waste, will be built under the direction of the city, but at the expense of the contractor. The necessity of disposing of the mill wastes has long been felt, for sanitary reasons. These wastes, when discharged in the common sewers of the city clog the same, and cause the city great expense in clearing them out and removing the deposits. It has been found that these wastes as they are discharged into the open river, greaty contaminate the water thereof, and cause the deposit of vast quantities of disagreeable and noisome sediment along the bed of the river, and give rise to noxious and disagreeable odors, to the great discomfort of the inhabitants in the neighborhood.

The cost of this special system of sewers and of the works for treating the waste must necessarily be large, which the city and manufacturers desire to avoid as coming upon themselves. Mr. McDowell proposes to erect works for treating the sewage containing wastes, and removing from it all soap, grease, and other matter, in such a manner that no nuisance shall result by reason of the processes employed, with stipulations, however, that the city and manufacturers shall deliver, or cause to be delivered, to him all of this kind of waste for a period of at least twenty-five years.

Should this scheme be determined upon, we shall have more to say in regard to it, with illustrations, etc., provided we think it will be of sufficient interest to our readers.

—A strike of weavers in a Pennsylvania mill recently proved a lucky affair, and possibly was the means of saving several lives. While the weavers were arguing with the management for an advance of 25 per cent., during which they were not at work, one of the engines was stopped pending an adjustment of the weavers' differences with the company, and the engine and machinery examined, when a long crack was discovered in the big piston rod. A few hours' revolution and the rod must have broken and might have forced its way through the walls of the adjoining room, where the workers were congregated.

—We notice in one of our New South Wales exchanges that the grand champion ram at a colonial sheep show was a pure Vermont merino, three years old, and for which the sum of $3700 was offered, but decined, $5000 being the reserved price. The Vermont wrinkly merino sheep is greatly desired for breeding purposes in the middle and western parts of the colony.

—The heaviest Rambouillet fleece on record, according to a writer in an agricultural paper, weighed 60lb. at 17 months and 10 days growth. It was taken from a three-year-old Californian ram. The heaviest merino fleece of 12 months growth weighed 52lb. It was taken from a Spanish ram named Baby Lord, bred in Kansas. No mention is made of scoured weight in either case.

KNITTING DEPARTMENT.

The Knit Goods Situation.

Higher prices for the whole knit goods line are now almost a certainty. For two or three weeks a general gathering of knit goods dealers in New York has been talked of confidentially, having as its single object the marking up of prices by the entire trade. At present writing, it seems probable that this action will have taken place by the time the October number of the TEXTILE WORLD is in subscribers' hands. At least, many of the larger knit goods concerns have agreed to send representatives to such a meeting. A forecast of the outcome is, of course, pure speculation. Their readiness, however, to participate in a movement of this sort shows the distinctly favorable sentiment toward higher prices. They are inevitable, even if there is no uniform upward movement. Very many invoices are now stamped "Goods subject to advance without further notice." The speculation of the general world has now reached knit goods, as is shown by some large orders for goods that cannot be used for fully a year to come. Still, these are not numerous enough to show portentious gambling tendencies. Business the last two or three weeks has seen a decided improvement upon the steady betterment of August; still the dealers add in the same breath that it is a bulk business, which is equivalent to saying that an enormous quantity of goods have to be sold to show much of a profit. It is well to remember, however, that the trade measures its business on fine goods against that of 1892, which was top notch for all history. As compared with the average, the discrepancy is not disheartening. Spring business, with most houses, has been much larger than at any time since 1892. Where a year ago 25 or 30 cases was the average order, 90 to 100 are now called for; so it will be seen that the movement has more than doubled. In July, the trade, in many instances, did not have the goods to sell, and I am told by two houses that they did something they had not accomplished for years, and had about abandoned hope of ever again doing:—cleared up their stocks. Jobbers are very generally reported as ordering without regard to the few goods they have on hand although such a course has not been thought of for four or five years. This improvement is not looked upon as transitory by some of the best judges. The tariff on wool has been of decided advantage to the underwear folk, and it has shut out pretty much all the low grades of hosiery. It must be admitted that while the trade in fine goods has not increased, proportionately, the demand for higher priced lines is improving from day to day. Balbriggans, Egyptian fancies, lisle threads, ribbed and Sea Island yarn goods, show a particularly active demand. The Western trade is just now ordering liberally, and with a less degree of fickleness than usual. If an average advance of 6½ per cent. can be gained, to offset the advance in yarns, the trade will be content. The course of foreign knit goods is exactly what might have been expected. The finer grades of hosiery are stationary, while the higher lines of underwear are tending upward. Taken altogether; it is several seasons since the whole trade has been feeling better at the outlook.

—From a very early period Indian manufactures and products were highly prized throughout southern Asia; gradually they found their way to Egypt, with which country an intercourse seems to have existed from the earliest times, by way of the Persian and Arabian gulfs.

News from Chemnitz.

KNITTING.

Writing romances would be easy compared with the work of writing news about knitting. Most manufacturers are helping each other to do nothing. Orders are as rare as white blackbirds, and valuable as the Siam king's white elephant. Hose, half hose, and knit gloves are as nice now as ever before, if not nicer; but no one wants to buy. Nothing new is to be recorded. Staples are standing at low prices with small orders. More men have been here this year, from the States, than were here in any year of the last ten--six surely; and yet manufacturers talk, talk and talk of this as the sour pickle time (Sauere Gurkenzeit).

One would suppose the outlook for the knitting mills was never better; and yet as pointed out time and again the United States market is the only great market for Chemnitz, and this is slipping away. Ft. Wayne, Philadelphia, Providence, etc., are creeping into a prominence that is having anything but a happy effect on hosiery exports.

The silence in the city is awful. The soot that so often hung over the houses like threatening clouds has given place to an Italian blue. Manufacturers with machines, big mills, taxes, mortgages, etc., with old help hanging on, hoping to be pensioned, etc., are to be pitied. If they are covering expenses, to say nothing of earnings on capital, they are lucky. Better, by all odds, are the agents and factors who give yarn to the working people to work up into hose, in the hills. Prices are so low that only enormous, unhoped and to be unhoped-for quantites could yield a profit. A few fancies are going at fair, if not good, prices; but in such small quantities that no one builds on them as a regular business, except those who do nothing in other lines.

These fancies are jacquard knitted hose and gloves. The demand is larger than the power to supply. This is because there are few machines. Fancies have had only fitful sales in recent years. No one has courage to go into them. One has to work too hard for what is squeezed out of the orders. Strange to say American buyers blame American buyers for running this market into a hole; Germans blame Germans. The latter say it is all due to the desire of middle men, factors and agents here to effect sales direct with Americans that has done it. The Americans say it all comes from buyers wanting to get goods cheaper, and cheaper, and cheaper. The result was worse and worse goods, with little or no wear and tear, till the domestics ran into the ring and knocked them out in one or two rounds.

There isn't a line to add to my last concerning styles. Disappointment, hopes deferred, discontent with America, has so discouraged designers that they don't design. The run is still after plaids. The rings in eastern colors and effects are being offered. It is hardly time to say what is to be their success. "On change" one hears half a dozen different opinions about the new tariff. One very bad feature about it, in my opinion, and in the opinion of the best informed judges here, is the combination of ad valorem and specific duties. This opens up the old road to successful under-valuation. One hears representatives of such houses as Blank & Blank, one would believe to be above it, justifying the system of averaging. I have no hesitation in saying that half the exporters here honestly (?) believe themselves justified in resorting to this trick. Custom's office cannot keep too close a watch of goods going from houses here that have branch houses on that side.

In machinery there are not a great many new ideas. Schubert & Salzer are out with some pretty open work patterns on jacquard machines. Besides these, there is nothing to be noted. Machines are still going to the States.

After the tariff came the deluge; floods, floods, and floods. The waters of the world seemed to have gathered

over the empire. Saxony's losses in life are very large; in money, millions. Chemnitz, although a thousand feet above sea level, suffered terribly. Some firms lost the earnings of years. The full extent of the losses will never be known. The weather was wicked. It is now only tolerable. Many, if not most, of the buyers have gone. Mr. Mullen is still here, so is Mr. Jones, of Walker, Stetson & Co., and Mr. Calhoun, of Ely Walker. Mr. J. Shartenberg, of Shartenberg & Robinson, of Pawtucket, was here for a few days, as guest of the U. S. Consul. They were boys together. Mr. S., before going on to Berlin, looked about for an agent for a new syndicate, "The Alliance," I think it was named. Some one suggests that the Newport belles that are putting up garters for the judgment of the beaux to decree a prize to the prettiest, put up their hose for prizes. This, say interested parties, might boom fancies and fetch blacks such a blow as to drive them out of fashion. Recent reports that have reached here, in a round-about way, via Berlin, are to the effect that the prospects in China and the East are good. I certainly hope so. It is wicked to see people willing and wanting to work unable to find any. Do not imagine that these people are entirely disheartened or discouraged. It is only for a time. They have had too much practice climbing over tariff walls to be beaten by Mr. Dingley's. If they cannot go to Berlin via Dresden, they will go via Leipzig. In other words, if they can't get their goods in at the old rates, they will find ways to get in at the new. Fertile in resources, untiring in energy, skilled in methods, they have at their hands all manner of ways and means for winning a way into our markets. They did it before, they will do it again. The only safe and sure way is specific duties, and constant improvement in quality, style, etc., of domestic wares.

—Perhaps the most important detail in vat dyeing is a thorough knowledge of the use of lime; it is the most frequent addition made to the vat.

Retrospect and Prospect of the Knitting Machine.

GIBBONS FRAMES.

To keep up with the advancement of improved machinery is no small item of expense to the manufacturer in almost all lines of business, and the users of knitting machines are no exception.

The query arises: "What have we gained over the knitting machines of the past? say, the last twenty years. Then stockings were knit on round frames with spring bearded needles, and the feet were cut to shape with scissors or a die cutter, and then seamed up on sewing machines or knit on balmoral frames, with various numbers of feeders,—from two to as many as fifty-six. The latter machines used the latch needle, and was capable of an endless variety of patterns, the stripes of course being circular, or around the stocking. The former machine (round frame) was often used for making stripes, but this necessitated the stopping of the machine in order to tie in the next color; but, at that time, many of the stockings were bleached, and in that case the machines were very productive.

The crude hand-knitter (seamless) then made its apearance, but was of such coarse gauge that the goods were slow to be appreciated. Finally they got as fine as 100 needles to a four-inch diameter head. Then devices were invented for raising the needles automatically, the machine being run by power. Then came the present full automatic, which has been improved, in that the capacity for work has been somewhat augmented. So far, the inventions have increased the production over the old hand machine, about fifty per cent., the gauge not being very materially changed.

At the present time, quite a number of manufacturers are having the old hand machines of twenty years ago, altered into what are called semi-automatic, and are competing with the regular automatics (whether successfully or not, the writer does not say).

So in looking back over the twenty years, it may be asked: What has been the gain? Do we make any better goods? Do we make as good a stocking as we used to make?

If any person contemplates putting in automatic seamless knitters, there would seem to be no fear of being superseded by a very much superior make of machine, as the improvement apparent is in the capacity and durability of the machine, and none in the character of work produced. When the stocking is completed, it is nothing but a bag sewed up at one end, and that closing is about the only good piece of work done on the whole job, and of course costs more than any other two operations.

Now that we have a tariff that will guarantee us in putting more of the character of toe work on the goods, why not make a stocking that will fit the foot, look presentable, and worth more than the price we have to pay for getting a pair washed! That would mean, go back to the old round frame, knit the leg on a four-inch head, 250 needles, and knit the foot on three-inch seamless, 200-needle, and transfer the work from the seamless to round frame, and shape out fifty extra needles to give the stocking a shape, and then the ankle would not be the same size as the top of the stocking. Or, why not use the flat frame, known as Cotton's patent, and give us a regular made goods? Why will not some enterprising machine builder, with capital, build such a machine for our home trade? There is plenty of room without interfering with any patent.

Nearly every manufacturer will tell you he wants to make stockings for the million, and the bag is the only thing the millions want. But that is quite doubtful. The millions know a good thing when they see it. There is a large field for such goods, or why all the howl about imported stockings? Already quite a number are beginning to open their eyes to the fact that we must make better goods, or they will yet be imported.

Let us have a stocking of good yarn, well knit, well shaped, and well finished. If the seamless machines will not make them, let us make a machine that will, or buy one that is already made.

Notes About Knitting.

Let me say, for the past twelve years your magazine has tried to find a way to aid and interest the thousands of its readers, who are interested in the textile industries, by bringing out new ideas, from its band of contributors, and giving the same to the different trades. Not like the magicians who rarely tell how they perform their tricks, for they all like to keep up the atmosphere of secrecy. Not so with the writers to your journal, for everything is given in plain terms, so that any one with a common education may readily understand the different rules in connection with their calling. Bear with me when I say there are many people in this country who are quite conversant with the principles of knitting, but are unaware of its origin,—not the power frame, for I have already spoken of this, but the manner or art of knitting. I have spent many hours trying to discover its earliest history. If any of your readers can find anything authentic, earlier than the beginning of the fifteenth century, I would be glad to hear from them, for it is not till then that any reference is had of knitted goods, as articles of wearing apparel, such as socks, hosen, or hose, as the Saxon word has it, for a covering for the legs such as the women in the Highlands of Scotland knit, or nit:—to unite as threads by needles. In Sir Walter Scott's Fair Maid of Perth, mention is made of the Highland bonnets which were "nit" by Oliver Proudfute. Oliver said, "I can make bodily oath to the bonnets I made, for they are of quaint design, and I should know my own stitch for the Highlanders wore, and do so still, the glengarie. It is strange to think that the art of weaving appears to be coeval with the first dawning of civilization, for we find it practiced with

great skill by the Egyptians at a very early period; and the process of manufacturing such fine linen as I saw a few years ago when an Egyptian mummy was unveiled at Round Lake, it seems to me must be lost, for the fabric was of fine texture, and as thin as the finest tissue paper that I ever saw. The industrial arts held an important place in the occupations of the Egyptians, and nearly all trades have special mention in the scriptures,—as spinning, weaving, carpentering, tent making, and even hair dressing; but nothing about knitting till A. D., 41, when we read in Acts X : III—third clause: "As it had been a great sheet knit at the four corners, and let down to the earth." The Rev. D. A. Clark writes on this: "Perhaps it was intended to be an emblem of the universe, and its various nations." So in the literature of the past I cannot discover any illusion to knitting in any manner earlier than herein stated. I have made it a study for sometime, to see if I could trace in any way, anything earlier than the time above given.

Scotland must be credited with being the first country where knitting was generally practiced, and Egypt, the first country for linen.

Useful Hints to Young Men: For their benefit while employed in the knitting room, it would be well for them when new machines are being put in or changes made in others, to take notice of the fundamental principles acted upon by those who are setting them up, for at some future day it might be to their advantage, if they could take hold and set up a new one, or take down and reset an old one; for there is no country in the world where men with eyes that see, ears that hear, brains that think, and wills that can execute, can forge themselves to the front, so well as here; and there are more good positions looking for the right men, than there are competent men to fill them. A. SCOTLAND.

—Tin crystals are largely used now as a discharging agent in calico printing.

Education in Knitting.

The new Leicester Municipal Technical Schools, now fast approaching completion, are to be opened by the bishop of London, on the 5th of this month. Of the four stories, the two lower are to be devoted to technical subjects, including boot and shoe manufacture, dyeing, hosiery, etc. Two rooms have been allotted to instruction in hosiery manufacture, viz., a class room and a machine room, together with the use of a lecture room for special lectures. The course of instruction in respect to hosiery will be in the line of studying the principles underlying the art of knitting, etc., and a knowledge of the different methods observed, and to teach each student to think for himself, and this combined with practice, is hoped to bring excellent results.

It is some twelve years since the technical classes in hosiery manufacture were first established in Leicester by W. T. Rowlett (now president of the Leicester Chamber of Commerce). The first introduction being a paper read by Mr. Rowlett before the Leicester Chamber of Commerce, on Sept. 21, 1881, on the subject of "Technical Education." This was followed by a request that arrangements should be made for the commencement of such classes. This was done, and Mr. Rowlett undertook the position of gratuitous instructor during the earlier sessions.

We allude to the name of W. T. Rowlett, because he was the translator of Gustav Wilkomm's German work on "Framework Knitting," with which some of our readers, no doubt, are familiar. One great drawback the hosiery classes will have to contend with is the absence of technical books on knitting. No text book exists for classes of this kind. The nearest approach to it is the one just mentioned by Prof. Willkomm, but this, now, is not up-to-date, as it should be, for proper instruction to pupils.

—The origin of the art of dyeing is shrouded in the mists of antiquity.

POWER DEPARTMENT

O. R. YOUNG, M. E., Editor.

The Scotch Boiler.

The Scotch boiler, or, as it has been descriptively named, the multi-return tubular marine boiler, says J. H. Allen in "Dixie," has been the marine boiler since most of us were boys. The fact that it is self-contained and that not only its fire box, but its ash pit is internal, has rendered it especially suitable for marine work, in that the danger from fire is reduced to a minimum.

Its first move was to displace the older form of rectangular boiler, and then came a long series of modifications in its own construction, that has put it in the shape in which we find it to-day.

It is really a two-storied affair, the lower story being occupied by the fire boxes, from which the gases pass into the combustion chamber, which may be considered as the sort of stairway by which they rise to the upper story that is filled with the nest of tubes which open into the smoke box; and there are specimens where a third story is added by passing the flue through the upper part or steam space, and thus attempting to squeeze a little more heat from the coal. But this form has passed away as being an expense without effecting a corresponding saving.

What is particularly interesting in this type of boiler is its growth. The small sizes required by the earlier engines, and to which they were limited by the sizes and thicknesses of sheets that were obtainable, have given place to the mammoth affairs of our modern liners and battleships. The tubes which were originally expanded and possibly beaded over on the smoke box end are now screwed into the sheets, where they are used as stay tubes.

It is interesting to note, however, that while the diameter of the boiler has risen twofold, the length and diameter of the tubes, with the thickness of the metal composing them, has changed but little. Thus, in an old ministerial circular issued in France, away back in the fifties, is found that in the imperial navy the boiler tubes should have a length of from 6 feet to 6 feet 6 inches, with a diameter of 3 inches for natural draft, and that their thickness should be 1-10 inch for brass and 1-8 for iron.

Making a jump down to the specifications for our own Minneapolis, we find that the length is 7 feet 3⅝, the diameter 2⅛ inches, and the thickness of the ordinary tube 10 inches. If these can be taken as the most efficient dimensions for an all-around tube that is to be used with both natural and forced drafts, it is very evident that these dimensions were learned at a very early period in the construction of the Scotch boiler.

One of the variations of current from former practice is found in the arrangement of the tubes. It was at one time considered advisable that each fire box should have its own battery of tubes and combustion chamber, as well as its own grate and ash pit, in order that it might be cut out, in case of accident, without losing the service of the whole boiler, a practice that no longer prevails. But we are assured that the only reason why the practice was not extended to embrace the steam space, smoke box, and even the stack, which have always been in common, is that the complication and weight of the apparatus would have been too great.

One of the greatest improvements in the Scotch boiler has been the introduction of the corrugated flue. It is a matter of detail that has probably been productive of more actual money saving in the way of repairs and the prevention of disasters, to say nothing

of nervous wear and tear on the part of the engine room force, than any other one improvement that has ever been made on any type of boiler. It is self-stayed and the irregularities in the expansion due to unequal temperatures in the fire box and ash pit have the minimum effect.

With the large boilers of from 15 to 17 feet in diameter, that are now in use, and the necessary adoption of four large fire boxes, it has become impossible to keep all the grates upon the same level as when there was not more than two fire boxes in a single boiler, but the doors of both fire box and ash pit are flush with each other, while there is a minimum amount of projection given to the breeching.

As in the locomotive type of boiler, the Scotch boiler has a large area of flat surfaces that must be stayed against deformation under steam pressure, and it is this staying that adds so materially to the cost of these two types of boilers. There exists some variation, however, in the practice of the marine and locomotive men in the staying of flat surfaces. To take two examples at random, we cite the well advertised No. 999 of the New York Central & Hudson River Railroad, and the boilers of the United States battleship, "Texas." In the former the stay bolts of the side of the fire box are 7-8 inch and 1 inch in diameter, and are spaced not more than 4 inches from centre to centre, while in the division partition between the two combustion chambers of the double ended boiler of the latter, we find the stay bolts to be 1⅝ inches in diameter, and spaced 8 inches apart. Thus we have four times the area stayed by less than twice the sectional strength of stay-bolt metal, while the boiler pressures are 180 pounds per square inch for the locomotive, and 165 pounds per square inch for the battleship.

To be exact in regard to the relative strength of the stay bolts in the two boilers, those of the locomotive are 1.94 times stronger than those in the marine boiler for the pressure they have to carry, provided that the tensile strength of the material used is the same, which may be assumed to be the case.

Of course, the thickness of the plates of these large marine boilers is very much greater than in locomotive work, those of the "Texas" being 1 5-32 inches thick, while those of the "999" are but 9-16 inch, but the diameter of the latter is only 4 feet 10 inches, as against a diameter of 14 feet for the former. How insignificant, by comparison, do the old Scotch boilers appear where a pressure of from 30 to 45 pounds per square inch was rarely exceeded, either with or without a forced draft. And as one author expressed it: "If these pressures are exceeded we will need very much heavier sheets and a perfect forest of stay bolts."

Forcing the fires in these large boilers has had a very detrimental effect upon them. The unequal expansions to which the several parts were subjected caused a leaking of the tubes, and it is not long since the matter was of such vital importance in the English navy that the authorities almost despaired of being able to remedy it. But improvements in the setting of the tubes and in the method of staying the tube sheets have so far overcome the difficulty that, like gangrene in a modern surgical operation, it is now considered an inexcusable defect.

The evaporative efficiency of these boilers has been repeatedly assailed during the past few years by the advocates of water tube boilers, and repeated experiments have been made to determine just what they are capable of doing. In comparison with the locomotive form of boiler, there is probably not very much difference in evaporative efficiency under the same conditions of draft.

In reviewing the present status of the construction of the Scotch boiler, we may take it that 2 square feet of heating surface per indicated horse power, under a forced draft, is not far from a fair average of good practice; rising to more than twice this for a natural draft, and, indeed, I have an

instance in mind where 12 feet were allowed.

In the earlier constructions we find that Fawcett and Miller recommended from 6 to 6½ square feet, while Penn, Mandsley and Bury recommend 10 and more. But current experience goes to show that the recommendations of Fawcett and Miller are not very wide of the mark, with short tubes. It must be remembered, however, that the personal equation enters very largely into what is used in any particular case, though there are no wide variations from what might be called the established practice.

Of course, no such boiler as this could run the gauntlet of two generations of inventors, without having appeared in a great variety of forms, as will be seen by a reference to files of technical publications and treatises dealing with the subject.

Among this wide variety we find that some designers have attempted to avoid all flat surfaces, as Lentz has recently done in his locomotive boiler, where every part is either cylindrical or spherical, and thus not only add to the strength, but do away with all stay bolts; but they have all passed on to oblivion, because they strained the sheets in the process of manufacturing, or were impossible to clean, or because their only advantage was a theoretical one based upon false premises.

So we still use the flat ended boiler, with flat surfaces well stayed, free from obscure corners that are out of reach of the cleaning scraper, and this is the system actually in use in all the navies and upon all of the merchant marine of the world, except where the water tube boiler has crept in.

There is some uncertainty as to the origin of this form of boiler, and the first application is variously located. Miller says that the first boiler of this type was used upon the English steamer Aimwell, in 1831; Gengembre puts it upon the French steamer Vantour, in 1833; Penn says it was put on several steamers in 1838, and Cornu, who imported a boiler of this class into France, gives America the credit of having originated it in 1843. It is probable, however, that it was first built in England at about the date given by Mr. Miller.

Its early exemplers do not appear to have been very successful, however, for they became very rapidly choked with salt when at sea. In 1843 Mr. Mazeline put one into the French frigate Pomona, and was so successful with it, owing to a careful consideration of the conditions under which it was to work, that this seems to have been the real starting point of its general adoption.

American vs. Foreign Machinery.

In the April issue of Lords' Magazine, I read, "It is a fact, an undeniable truth, that our (American) machinery is of a lighter build than English product, etc."

Looking for reasons for this indisputable fact, among others may be mentioned that of the greater strength of American iron, and the writer's experience with American and English machinery has satisfied him that first class American machinery is heavy enough and strong enough for all purposes for which it is intended.

It is necessary for the English manufacturers to use more metal for the reason above stated, and the English manufacturer is one of the most conservative mortals on earth.

Patterns are still in use in English shops which were used fifty or more years ago, and will continue to be used until the market is in a greater or less degree lost to them, when they will possibly wake up to the fact that the American manufacturer is a "hustler," and then introduce American methods.

It is not to be denied that there is a lot of machinery made in the United States, which is far from being heavy or strong enough, and which finds a market simply because it does not cost so much. This excuse the purchaser uses for buying the trash, but is the reasoning correct?

Certainly not; for added to the bill is cost of maintainance, repairs, delays by stoppage on account of repairs, etc.

An instance came to the writer's notice four years ago, where a party was in the market for a steam engine, and prices were obtained from several builders.

The conditions demanded a thoroughly well designed and well built engine. The price for such an engine by a standard company was $2500; another manufacturer of engines, who has the reputation of building engines by the mile, and cuts them off by the yard at any price he can obtain, submitted price at $1700, including delivery of the goods 500 miles from his factory.

The purchaser accused the higher bidder of wanting an enormous profit, and placed his order for the low priced (?) machine.

Result: Engine erected, started, run three months with light load, engine paid for, load increased gradually (as new machinery was added to the works), up to only two-thirds of the manufacturer's rating of the engine, the crank shaft broke, and was replaced at purchaser's expense, broke again, replaced, hot boxes the rule in that engine, no regulation, enormous fuel bills, general dissatisfaction.

At the end of one year the purchaser took the "thing" out, and placed his order for the $2500 engine, having already—not reckoning delays to business,—charged up to maintenance of engine, repairs, etc, $800; and only one year's service.

The new engine was installed, started, has now been running three years with full rated capacity as average load. Repairs—none, maintainance and delays—ditto.

Which was the cheapest engine?

The writer has bought as well as sold machinery, and as a result of that experience would give the greatest attention to the highest bids in a competitive transaction, instead of commencing with the lowest.

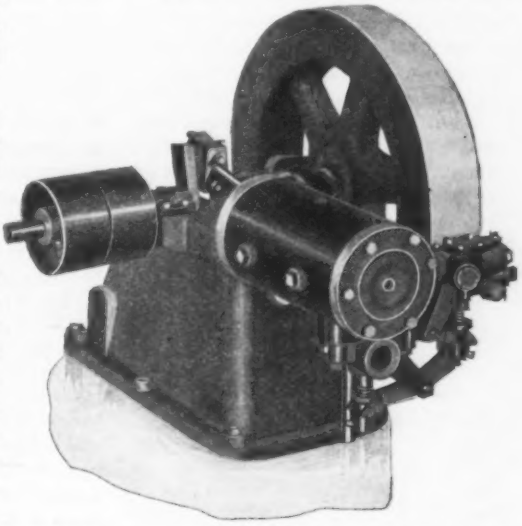
If the purchaser of American machinery confines his trade to strictly first-class builders, those who have a reputation at stake and who look to the engineering, as well as the commercial, side of the question, there is no reason why American machinery should not obtain the markets of the world and hold them too.

—Ike Cann.

The Jones Gas Engine.

BUILT BY LEWIS JONES, PHILADELPHIA, PA.

Perhaps the safety, advantages and



economy of the gas engine is less understood than those of any other system of power. The cost, where the engine manufactures its own gas, is not over one cent per horse-power hour. The gas machine is buried under ground, outside of the building and below the level of the engine, and nothing but gas can enter the building, which gas is conducted in pipes like city gas. This is claimed to be a new system, has been inspected and approved by the Philadelphia Underwriter's Association, is harmless, and first cost is very low.

The engine can be started instantly, and gives full power immediately. It is important to remember that there is no steam pressure to get low and give annoyance, that the engine will give its maximum power from the start, and continuously until stopped; and that the repair bills will be comparatively low, there being no grate or chimney to keep in order and no boiler to rust out; no flow of water required.

The Jones engine has been built with a view of eliminating as many unnecessary parts as possible and making all motions positive. Thus the inlet valve, which is frequently worked by suction, has a positive mechanical motion to open it. The electric igniter is in this valve and is, therefore, not subject to excessive heat. Both this and the exhaust valve work vertically, hence there is no side wear on the valve stems. The motions which operate these valves are easy, durable and quiet in operation. All sizes are built to stand horizontally and firmly. The bed is high enough to allow the fly wheel to clear the floor, thereby reducing the cost of the necessary foundations. Spiral gears are used for this work, and the engine is designed throughout for durability.

To find the Boiler Capacity for any size Engine.

The performance of a boiler is determined by the number of pounds of water it will evaporate per hour, the amount of fuel and temperature of feed water being noted, and it is customary to calculate what amount would have been evaporated, by the same quantity of fuel, under the normal atmospheric pressure, and with feed water at 212 degrees, F. This is technically expressed by the term "from and at 212°."

Heat is measured by the change of temperature it produces in a given weight of any substance. A "heat unit" is that amount of heat which will raise the temperature of one pound of water one degree, F., at its point of greatest density (39 degrees, Fahr.).

The number of heat units in one pound of water at any given temperature is called the "heat in liquid."

If heat is applied to water in a vessel, the temperature will rise until its boiling point is reached. Beyond this point no increase of temperature will result; the heat absorbed being employed in transforming the water from liquid into steam. This is called the "heat of vaporization," and diminishes as the temperature and pressure increases.

The "heat in liquid" added to the "heat of vaporization" is equal to the total heat.

The ratio of the amount of heat required to make one pound of steam under any given conditions to that required to make a pound of steam from and at 212°, is called the "factor of evaporation."

This factor is found by subtracting the heat units in one pound of the feed water at the given temperature, from the heat units, or total heat, of one pound of the steam at the given pressure, and dividing the result by 965.7, which is the heat of vaporization, or number of heat units required to evaporate one pound of water at 212° into steam at 212°.

The total number of pounds of water to be evaporated per hour under a given steam pressure, multiplied by its particular factor of evaporation, gives us the "equivalent evaporation" "from and at" 212°, or in other words, the amount of water which would have been evaporated, with the same amount of fuel, had the feed water been at 212 degrees and the pressure that of the atmosphere.

The example explains itself, as follows: first find the amount of water the engine is to use per hour, then the factor of evaporation, and the product of these two will be the equivalent evaporation "from and at 212°." 34½ pounds of water at 212° evaporated into steam at at atmospheric pressure equals a boiler horse power. Dividing the equivalent evaporation by 34½ must give us the horse power required, according to the commercial rating of boilers.

COLORS AND DYEING.

Dye Recipes for October.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 145.

Terra Cotta on Worsted Yarn.

Terra Cotta on 100 lbs. worsted yarn.

Prepare dye bath with

1½ lbs. Terra Cotta.
(Cosson & Lane, 36 Central Wharf, Boston.)
4 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 130° F., bring to boil while turning, and turn to shade at that heat.

A light dyeing of Terra Cotta is shown here, dyed with 1½ per cent. of color. Terra Cotta will combine with acid and other colors for shading. It works perfectly level on the fibre, and like Dark Blue from the same firm, it takes the color on slowly, resulting in level dyeings. It is fast and will not rub. (See recipe 51.)

RECIPE NO. 146.

Brown on Cotton Yarn.

Dyphenyl Brown and Black on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Dyphenyl Brown.
½ lb. Dyphenyl Black.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Common Salt.
1 lb. Sal Soda.

Enter in yarn at boil, and turn one hour at that heat.

By adding Dyphenyl Black to the Dyphenyl Brown a darker brown is produced. The two colors work well in combination, and as both are fast, they are valuable for producing full cutch shades. For future kettles use one-third less of the dyes. (See Recipes 80 and 96 for browns from Dyphenyl Brown; and Recipe 30 for a drab, and 31 for a black from Dyphenyl Black.)

RECIPE NO. 147.

Green on Cotton Sweaters.

Direct Green Y, etc., on 100 lbs. cotton sweaters.

Dyed in the garment.

Prepare dye bath with

2 lbs. Direct Green Y.
6 oz. Direct Black K.
(A. Klipstein & Co., 122 Pearl St., New York.)
25 lbs. Glauber's Salt.

Enter in sweaters at boil, and pole at that heat 1½ hours; rinse.

Direct Green Y and Direct Black K work well for combination shades of green, and the color shown here is fast and well adapted for all kinds of hosiery yarns, raw cotton and piece goods.

(See Recipes 17, 33 and 119 for shades from Direct Green Y, alone, and in combination; and Recipes 68, 95, 104, 119 and 136 for shades from Direct Black K, alone, and in combination.)

RECIPE NO. 148.

Black on Cotton Sweaters.

Direct Black on 100 lbs. sweaters.

Dyed in the garment.

Prepare dye bath with

6 lbs. Direct Black K.
(A. Klipstein & Co., 122 Pearl St., N. Y.)
25 lbs. Common Salt.
1 lb. Sal Soda.

Enter in sweaters, and boil and pole 1½ hours at that heat; rinse.

Direct Black is well adapted for dyeing varieties of cotton, either in the raw state, in the yarn, or in the piece.

It is quickly dyed, and produces fast and level shades; and with light percentages of color, fine shades of grays and slates can be produced. (See Recipe 147.)

RECIPE NO. 149.

Slate on Worsted Yarn.

Chrome Fast Black B on 100 lbs. worsted yarn.

Prepare dye bath of

¼ lb. Chrome Fast Black B.
(New York & Boston Dyewood Co., 55 Beekman St. New York.)

2 lbs. Oil of Vitriol.

5 lbs. Glauber's Salt.

Enter in yarn at 100° F., bring slowly to boil while turning, and keep 3-4 hour at that heat; then add to the dye bath 1-2 lb. of bichromate of potash and turn another 1-2 hour at boil; then rinse.

This concern has just put on the market a new fast black, which will meet all the requirements of the mill, both for fulling and sunlight. It produces with 1 1-2 per cent. a full and brilliant black; and with small amounts of color several fine shades of pearls, grays and slates can be dyed, which are fast. The aniline itself comes in the form of a dark, dull, brownish powder, easily dissolved in hot water. It works very level on the fibre, exhausting the dye bath thoroughly. (See Recipe 115 for a black on cotton from Chrome Black B B.)

RECIPE NO. 150.

Black on Cotton Yarn.

Direct Black X on 100 lbs. cotton yarn.

Prepare dye bath with

6 lbs. Direct Black X.
(C. Bischoff & Co., 87 Park Place, New York.)

20 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Direct Black X, as here shown, is a fine color, and the dyer will find no trouble in working it. It is a color that works level and slowly on the fibre, and gives a fast color. It will combine with direct dyes.

RECIPE NO. 151.

Dark Blue on Worsted Yarn.

XLL Blue and Acid Black 5534 on 100 lbs. worsted yarn.

Prepare dye bath with

3 lbs. X L L Blue.

1 lb. Acid Black No. 5534.
(Read Holliday & Sons, Ltd., 100 William St., New York.)

5 lbs. Oil of Vitriol.

10 lbs. Glauber's Salt

Enter in yarn at 160° F., bring to boil while turning, and turn to shade at that heat.

The shade of blue shown here can be quickly and cheaply dyed. The color is fast and does not rub off. Both of the dyes work level and dye slowly on the fibre. (See Recipe 137 for X L L Blue used alone for a blue,)

RECIPE NO. 152.

Black on Wool Yarn.

Soudan Black No. 3 on 100 lbs. wool yarn.

Prepare dye bath with

5 lbs. Soudan Black No. 3.
(Sykes & Street, 85 Water Street, New York.)

4 lbs. Oil of Vitriol.

10 lbs. Glauber's Salt.

Enter in yarn at 140° F.; bring temperature up to boil while turning, and turn to shade at that heat.

Soudan Blacks combine with other acid dyes readily, and as they work evenly and slowly on the fibre, both alone and in combination, they will be very useful to the dyer. (See Recipe 130 for a black from Soudan Black 2.)

RECIPE NO. 153.

Red on Wool Yarn.

Milling Red F R on 100 lbs. woolen yarn.

Prepare dye bath with

1½ lbs. Milling Red F R.
(Wm. J. Matheson & Co., Ltd., 178 Front St., New York.)

5 lbs. Acetic Acid.

Enter in yarn at 120° F.; bring to boil while turning, and turn to shade at that heat.

Milling Red F R dyes are very level and bright shade of red, and also a fast color. A mordant of bisulphate of soda can also be used, say, 5 per cent. on dark or heavy dyeings, which gives the color a very rich cast. (See Recipe 133 for a bright red.)

RECIPE NO. 154.

Brown on Worsted Yarn.

Extract Fustic Liquor L, etc., on 100 lbs. worsted yarn.

Mordant for 1 1-2 hours at boil with

3 lbs. Bichromate of Potash.
2 lbs. Tartar.

Wash and dye with

10 lbs. Extract Fustic Liquor L.
(Stamford Mfg. Co., 133 Front St., New York.)
5 lbs. Alizarine Violet Paste.
3 lbs. Acetic Acid.

Enter in yarn at 140° F.; bring to boil while turning, and turn to shade at that heat.

For dyeing browns, either light or dark shades, Extract Fustic Liquor L, with Alizarine Violet, will be found to be of great value, as they combine well together and are fast to light and fulling. (See Recipes 34, 71, 72, 124 and 134 for shades from Fustic Liquor L, alone and in combination.)

RECIPE NO. 155.

Medium Blue on Worsted Yarn.

Alizarene Blue G B on 100 lbs. worsted yarn.

Mordant for 1 1-2 hours at boil with

3 lbs. Bichromate of Potash.
2 lbs. Lactic Acid.

Rinse and dye in separate kettle with

10 lbs. Alizarene Blue G B.
(Anchor Color Mfg. Co. 462 Cherry S., New York.)
2 lbs. Acetic Acid.

Enter in yarn at 110° F., bring to boil while turning, and turn one hour at that heat.

Alizarene Blue G B, as per sample shown here, dyes a deep, pure indigo shade of blue; works very level on the fibre, and like Alizarene Blue S C R, sold by the same firm, is a very concentrated and pure dyestuff. (See Recipe 140 for a dark blue on worsted, from Alizarene Blue S C R.)

RECIPE NO. 156.

Black on Cotton Yarn.

Direct Black on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Fankhausine.
10 lbs. Glauber's Salt.
6 lbs. Direct Black R.
(Farbenfabriken of Elberfeld Co., 77 William St. New York.)

Enter in yarn in a dry state, turn two hours at boil, then turn off steam; turn another 3-4 hour without steam; lift out and extract dry.

Unmordanted cotton yarn is dyed with Direct Black R, with common salt or Glauber's salt, or with the addition of some soda. With this a full, deep black is obtained. The properties of this dye are very satisfactory, and above all, it is exceedingly fast to washing. It also withstands the actions of alkalies, perspiration and ironing very well, and as regards fastness to light, it has been found to be perfectly satisfactory. (See Recipes 120, 132 and 144 for a dark blue and two shades of brown, from Direct Black R, in combination with other dyes.)

RECIPE NO. 157.

Gray on Wool Yarn.

Azo Acid Black R on 100 lbs. wool yarn.

Prepare dye bath with

4 oz. Azo Acid Black R.
(Victor Koechl & Co., 79 Murray St., New York.)
10 lbs. Glauber's Salt.
2 lbs. Oil of Vitriol.

Enter in yarn at 110° F., bring to boil slowly while turning, and turn to shade at that heat.

Azo Acid Black R dyes very fast shades of grays and slates with small amounts of color, giving level and fast shades. (See Recipes 116 and 131 for shades of blue in combination with Azo Acid Blue B. See Recipes 48, 59 and 70 for colors from other Azo Acid dyes.)

RECIPE NO. 158.

Pea Green on Worsted Yarn.

Anthracine Green on 100 lbs. worsted yarn.

Prepare dye bath with

¼ lb. Anthracine Green N.
2 oz. Anthracine Yellow T.
(Hanna-Schoellkopf Co., 135 No. Water St., Philadelphia).
10 lbs. Glauber's Salt.
1½ lb. Acetic Acid.

Enter in yarn at 140° F., bring to boil while turning, and turn to shade at that heat.

The above two dyes are well known on the market for their fastness and cheapness, and a great many shades of green can be produced by their combinations.

RECIPE NO. 159.

Reddish Brown on Cotton Yarn.

Chromanil Brown G G on 100 lbs. cotton yarn.

Prepare dye bath with

2 lbs. Chromanil Brown G G.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
30 lbs. Salt.

Enter in yarn at boil, and turn one hour at that heat; then lift and turn 1-2 hour at 180° F. in a bath of

1 lb. Bichromate of Potash.
3 lbs. Blue Stone.

Chromanil Brown G G as shown here is a very fast color, standing all mill tests. It works very level on the cloth or yarn, and is adapted for all work where fast shades are needed. (See Recipe 138 for a shade of brown.)

RECIPE NO. 160.

Blue on Cotton Yarn.

Diphenyl Blue and Black on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Diphenyl Blue.
½ lb. Diphenyl Black.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Common Salt.
1 lb. Sal Soda.

Enter in yarn at boil, and turn one hour at that heat.

The dyes used in this recipe combine together and work perfectly level on the fibre. Dark blues and blue blacks can be obtained by combining the two colors, and the shades are very fast. One-third less color is used in standing kettles. (See Recipes 74, 87 and 121 for shades of blue from Diphenyl Blue.)

New Dyes.

We have in this issue but few dyes that have not appeared in our Dyers' Supplement during the current year, but we have a number of new combinations which should interest many of our subscribers.

In recipe 150 we use Direct Black X, furnished by C. Bischoff & Co., New York, for the production of an attractive black on cotton yarn. This dye can also be used on mixed goods consisting of wool and cotton, or silk and cotton, and it gives excellent results on the latter class of work.

The use of Acid Black 5534, in combination with X L L Blue, both furnished by Read Holliday & Sons, New York, for obtaining a dark blue on worsted, is seen in recipe 151. X L L Blue was used alone in recipe 137 for a handsome shade of blue on worsted. The present combination should attract attention. Acid Black 5534 is a good fast black on woolens, hats, etc., dyeing in the regular way. Being a blue shade, it is particularly useful for several purposes. Anything that applies to a good acid black, blue shade, can be said of this color.

In recipe 155 we show a medium blue on worsted, produced by the use of Alizarene Blue G B, furnished by the Anchor Color Mfg. Co., New York. This dye is of the same character as S C R, shown in recipe 140, only it gives a better navy blue shade.

Roundabout Notes.

A. J. Green has discovered that paranitraniline red is much more brilliant and more intense when dyed on to mercerized cotton, and this is not exactly a startling discovery, in view of the fact that most dyes go more intensely on to mercerized cotton, and that the fact has been known for some time. Still, no authority in the dyeing trade seems inclined to be the first to say that Green's discovery is no discovery at all, and at any rate his facts are perfectly right. In the first place, mercerized cotton, whether bleached or not, has a greater affinity for betanaphthol than unmercerized cotton,

Consequently, weaker solutions can be used, and there is a saving here; in fact, instead of one part of standard beta-naphthol solution in four parts of water, one part in eight parts water can be used. The mercerizing bath is caustic soda 32 degrees Tw., and half an hour is given in this, the cotton being then washed and passed through the beta-naphthol solution. It is then dyed with the usual percentages of paranitraniline red. Paranitraniline red on unmercerized cotton is a dangerous rival to Turkey red, but on mercerized cotton it is more so, and the author claims that it has also the advantage in fastness to light.

In gold thread made by rolling copper wire coated with an alloy of copper and zinc round cotton thread dyed yellow, which is the usual method of producing imitation gold thread, the threads often lose their metallic lustre, becoming tarnished and marked with black spots which increase as time goes on. This has usually been laid down to fumes of acid or sulphur in the atmosphere, and in the preparation of the cotton dyers have chosen coloring matters which would not act upon the alloys of copper, avoiding also acid mordants. Vignon, however, has discovered a case in which he could distinctly trace the injurious result to the presence of salt in the thread not thoroughly rinsed out after dyeing. He finds that with half per cent. of salt in the cotton, gold thread will tarnish rapidly, and believes that hydrochloric acid is freed by the electrolytic action of the copper and zinc alloy and does the mischief. His recommendation is, therefore, that sulphate of soda should be substituted for salt, and the rinsing after dyeing should be more thorough.

One more chrome mordant for cotton is recommended. Chromium hydrate can be fixed on the fibre in the following way: 35 grammes of bichromate of soda are dissolved in 50 c. c. of water and 14 c. c. of sulphuric acid are added. This is boiled, and then 10 grammes of glucose in 25 c. c. of water is put in. The mixture is diluted with from half to one litre of water, according to the strength of shade to be dyed. The cotton is entered into this bath, steeped, wrung, and next entered into a bath containing from two to three per cent. of sodium sulphide, made by boiling flowers of sulphur in caustic soda. Chromium hydrate is thus fixed on the fibre.

According to an Austrian textile paper, reversible felt cloth, that is to say, with a different color on either side, is now made in a way that is a decided improvement on the old method. Formerly, two pieces of felt were dyed different colors and then simply cemented together, but this primitive method is now swept away. The two pieces of felt of different colors are now taken immediately after rinsing from the dye bath and without drying, and a layer of carded wool is put between them. The cloth made of three layers in this way is then thoroughly milled, and a much closer union is gotten than by the old glue-pot plan. The apparatus for the operation is very simple. The cloths are wound on to the upper and lower cylinder of a frame containing three bowls, and the wool is on the middle roller. They are then wound off together in the proper position for milling.

Caseine is an important manufacture in Germany. It is also known in commerce on the Continent as lactarine, and is a product very analogous to albumen, both in appearance and uses. It is made by treating skim milk with weak acetic acid, filtering, washing and drying. The product is then a slightly yellowish body, insoluble in water, but easily soluble in alkaline water, ammonia and borate of soda. In textile printing it is used exactly after the fashion of albumen. Like that body, it coagulates with heat, and passes then into an insoluble state, fixing the colors mechanically on the fibre in the case of mineral

pigments, and chemically as a mordant in the case of the artificial dyestuffs.

Caseine could be used in dyeing to fix wool coloring matters on to the cotton in mixtures (unions). If a wool and cotton mixture is prepared with a solution of caseine in ammonia, steaming after drying, the cotton can be dyed in the same bath, as the wool and the color is fast to washing with water.

The Dyers Art in 1747.

A little book has come to light published in 1747, the writer of which professes to review all the trades, professions and arts, "liberal and mechanical," then practised in London. "In London," says the writer, "there are dyers of all sorts; some dye only wool, others silk; some confine themselves to particular colors, such as scarlet and blues; the scarlet dyer is by much the most ingenious and profitable branch of the dyeing business; the best dyes that are struck of that color are done upon the river Severn—the water of that river has some influence upon the operation, which renders cloths finished there preferable to those made anywhere else in Europe. The business of a dyer in the woolen way in general is very laborious and chilly; they are constantly dabbling in water hot and cold. The silk dyers have not so much labor as the other, but all classes require a moderate degree of strength; a youth ought not to be bound until fourteen or fifteen years of age. The general wages among dyers is half-a-crown and three shillings a day. The woolen dyers, besides copperas and the fulling mill, which is an engine moved by a horse for milling the cloth, have a hot-press to give it a gloss. The silk dyers, instead of a press, use an engine called a mangle or calender. The silk, when dyed and dry, is rolled round a roller and put upon a smooth plain, under a great weight moved backward and forward by the interposition of a wheel and a horse."

—The following signs indicate that an indigo vat is in good working order: (1) The liquor has a yellow color approaching to olive green; (2) the presence of numerous long blue and somewhat copper-colored veins on the surface—these hang together and quickly re-form if blown on; (3) the head is well united, frothy, and has a distinct coppery hue; (4) on striking the surface a number of bubbles form and remain standing; (5) a drop of vat liquor placed on the hand becomes a distinct green and then dark blue, staining the hand; and, finally (6), if a sample of the vat liquor held up to the light in a glass beaker is of an olive green color and changes to blue green in the air. A vat presenting these signs has usually a sufficient supply of indigo in solution, and should only be fed moderately with lime.

—Each of the terms "beer" or "half-beer," also called a "porter" or "portit," means a group of ends, and the number of ends in a group varies very considerably; for instance, in gray warps a "beer" often means 20 ends, and a "half-beer" 10 ends, whilst in colored warps, 6, 8, 10 or 12 ends are designated half-beers. The use of these divisions is to assist in the spreading out to the proper width, of the threads of a ball or mill warp, in the operation of beaming or winding on, each group being laid between the teeth of a "waithe" or winding-on comb.

—By the term "cut," is meant a certain length of warp, and is a variable one. It is usual, when weaving piece goods, to have the warps marked, so that the weaver can tell when the required length of cloth has been woven. The marking can be accomplished either on the mill, sectional frame, or slasher sizing machine, and consists of a smit of some loose color.

—Fuller's earth is undoubtedly one of the most ancient of industrial products. It was probably used long before soap, which itself is of considerable antiquity.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Paper Tubes.

Editor Textile World:

We use paper tubes 7 and 8 inches long, for woolen spinning, and have to buy in the East, which is not satisfactory, as it is expensive to ship them so far, besides not being able to get them promptly. Can you give us an estimate of the cost of making these tubes, that is, the cost of machinery, also the labor involved, and who manufactures the necessary machines. This, together with any other information, would be appreciated by

Michigan. Woolen Mills.

The cost of making these tubes is a secret which the manufacturers naturally guard closely. Many tubes are hand made, and the manufacturers that use machines usually have them made especially to their order, and in some instances, control patents. We do not know of any concern making a specialty of building such machinery. Our recollection of the machines, as having seen them in the shops of a few manufacturers, is that they are quite simple, and their production is very large. Taking everything into consideration however, our judgment is that is would hardly be a profitable undertaking for you to manufacture your own tubes, unless you used an exceedingly large quantity. If there was much money to be saved, it is probable that some of the large mills in the South, or even in New England, would have installed machinery for this purpose, and we do not call to mind any manufacturers who are making their own tubes, although there may be some.

Soap.

Editor Textile World:

Will you please give us a recipe for making a good, cheap soda soap, from grease, tallow or cotton seed oil, for scouring woolens?

Vermont. S. C. L.

The best recipes for a soap of this kind are held by soap manufacturers, and, if we are allowed to pass an opinion, we think it a mistake on the part of manufacturers to attempt to make their own soaps, with the facilities that they have at hand. We would recommend manufacturers to have their soap made by respectable soap makers, who have a reputation for honorable dealing. They are to be found, notwithstanding the fact that the opportunities are great for deception in the manufacture of this commodity.

Yukon Gold Fields.

Editor Textile World:

Can you refer me to good authorities relating to the gold fields of the Yukon valley, especially those in the Klondike region?

Massachusetts. M. A. F.

The best work that we have seen covering this subject, for popular appreciation, is a small work recently published by Rand, McNally & Co., Chicago, entitled "Golden Alaska" by E. Ingersoll. It is inexpensive. The most important work is the eighth volume of the tenth census report, on the resources of Alaska. The Alaskan volume of the eleventh census report, also contains valuable matter and an excellent map. A work dealing with mines and mining, a publication of great importance, is that entitled "Information Respecting the Yukon District," recently published by the Canadian Department of the Interior. There is a good article in Harper's Weekly, Vol. 41, p. 801, 1897, with a map and illustrations on the gold region. A very important article appeared in the Overland Monthly, Vol. 17, p. 611, 1891.

The Excelsior Spinning Frame.

Editor Textile World:

Can you inform me of the origin of the Excelsior Frame, and the early patents relating thereto?

Rhode Island. F.

The first patent that we know of that may be considered the basis of the system of cotton spinning as seen in the Excelsior Frame, is described in letters-patent 317,675, dated May 12, 1885. This patent was issued to I. H. Russel, East Hampton, Mass, and refers to a patent of even date issued upon the application of T. T. Abbott, filed November 8, 1884. The patent is described as a process of making cotton yarn, consisting in the bringing of the cotton fibre to the condi- of sliver, and drawing and doubling the

sliver for the purpose of evening it, and further drawing and compacting, or condensing, without twisting. The sliver is thus prepared, until it is reduced to the attenuated form requisite to allow it to be spun directly into yarn, and finally spinning said attenuated sliver directly into finished yarn, as contradistinguished from roving.

Books on Manufacturing.

Editor Textile World:

Wishing a number of standard text books on the different departments connected with the manufacture of woolen goods, I write to know if you will send me a list of the same, their authors and prices.

Indiana. C. L. R.

We should be pleased to send our correspondent a list of the books that would interest him, but the list would be a long one, and many of the books that would appear thereon would be of doubtful value. There are a number of textile books now being published, almost too many, in fact. There are the works of T. R. Ashenhurst that should be in the possession of every woolen manufacturer. They are up-to-date and written by as good an authority as can be found in Europe or in this country. The work by Roberts Beaumont on "Woolen Manufacture," is a good one to have, and especi ally can this be said of the recent publi cations of E. A. Posselt, 2152 No. 21st St., Philadelphia. Mr. Posselt's work on "Technology of Textile Design" is es pecially good. It can be obtained of the author. "Dyeing of Textile Fabrics," by J. J. Hummel, an inexpensive work by a high authority, should be had. "Woolen Superintendent's Guide" by Green has many points of interest; the only objection to it is its price ($5.00). Should our correspondent wish to take up jacquard weaving and designing, we would recommend to him the recent work by T. F. Bell. Prices can be given by any book dealer or we will supply the books. We have on hand a few copies on the "Power Loom and Art of Weaving" by Alex. Brown, at $1.25. This is a low price for a most excellent work.

Linen Fabrics.

Editor Textile World:

We have been told that you can give us a list of manufacturers of linen crashes, ducks, canvasses, etc. Will you kindly furnish the information?

Philadelphia. J. W.

We will refer our correspondent to our Textile Directory for 1897, which will furnish him with the information called for. It will be found advertised in this issue.

Book on Cotton Manufacture.

Editor Textile World:

We desire to obtain for a friend of ours in Brazil, a treatise or book on the manufacture of cotton goods. Our friend has a mill and our idea is that he thinks he can improve the work of the mill by having such a book.

New York. F. E. & Co.

We would suggest that the following books be obtained: "The Power Loom," by Alexander Brown (copies we can furnish at $1,25); "Cotton Mill Construction and Engineering," by Joseph Nasmith; "Students' Cotton Spinning," by Joseph Nasmith; "Modern Cotton Spinning Machinery, Its Principles and Construction," by Joseph Nasmith; "Cotton Spinning," by W. S. Taggart; "Cotton Weaving," and "Cotton Spinning," both by R. Marsden.

Coloring Matter.

Editor Textile World:

How is coloring matter classified?

Conn. G. B.

Coloring matter is divided into two classes, the mono-genetic, capable of yielding only one color, whatever mordant is used; and poly-genetic, capable of producing totally different colors, according to the mordant used.

Cotton Fringe Wanted.

Editor Textile World:

We have been referred to you for the following information: I have recently commenced the manufacture of a new cotton hammock, and use awning cloth and fringe in the making, like the enclosed samples. Cotton fringe is what I want. Can you give me the names of manufacturers of this article?

Mass. C. F. A.

We have replied by letter, and would refer our correspondent to our advertising columns for parties who are manufacturing fringes.

Tapestry Carpet Designing.

Editor Textile World:

Can you inform me where I can get instruction by mail on tapestry carpet designing; also where I can obtain paints, and designing paper in sheets, and other things necessary for tapestry carpet designing?

New York State.

We would suggest that our correspondent write to W. S. Gavey, Box 222, Brooklyn, N. Y., who makes a specialty of teaching designing. For material, write to those selling mill supplies, advertised in this issue. We have replied more fully by letter.

Dogwood and Hornebeam.

Editor Textile World:

Can you inform us of parties getting out dogwood heads in the rough for bobbins, or where the wood can be had that is known as hornbeam?

Vermont. C. D. C.

We have answered giving full information by letter.

Literature on Knitting.

Editor Textile World:

Can you inform me of any literature relating to the knit goods industry, especially to the manufacture of hosiery?

No. Carolina. J. S.

There is no literature published concerning this industry, except as it may be found in the trade journals of to-day.

Book on Hosiery.

Editor Textile World:

I wish to gain some knowledge of hosiery manufacturing, and would like to have recommended some work on this subject.

Philadelphia. W. E. W.

We do not know how we can satisfy our correspondent, as there is no work on knitting that would meet his case, unless he desires to take up the framework branch, and the best work on this subject is a German work by Gustav Willkomme, translated into English in 1885. It is a somewhat expensive publication and difficult to obtain. The best literature on this subject is that to be found in the knitting department of this magazine.

Dress Trimmings, Etc.

Editor Textile World:

Can you give me the address of one or two parties that handle dress trimmings, braids, etc., like samples enclosed?

Philadelphia. W. N. Y.

We insert the above inquiry from a manufacturer of the class of goods mentioned, (cotton braids) in the hope that his inquiry will attract the attention of parties in want of such merchandise.

Woolen Mills in South America.

Editor Textile World:

Can you give me a list of the woolen (weaving) mills of South America, especially those in Chile and the Argentine Republic? Is there any directory published of the textile industries of South America?

Ill. W. U. H.

There are no authentic statistics in English that we know of, referring to the woolen mills of South America. We will simply say that the number of such mills is small. The Bureau of American Republics, Washington, D. C., is now compiling, with the prospects of being in print by the last of October, a comprehensive commercial directory, which will embody in full all the information called for. The Bailly-Bailleire Annarie, published in Spanish in Madrid, Spain, contains the information desired.

Cotton Blanket Manufacturers.

Editor Textile World:

Will you please send me a list of the cotton blanket manufacturers in the United States?

California. L. T. H.

A list of these manufacturers can be found in the Textile World's Directory. We will simply say that there are two mills at Taunton, Mass.,—the Whittenton Mfg. Co. and the Elizabeth Poole Mills,—that make superior blankets of this kind. There are other mills in the United States that also make blankets.

Scouring Woolen Yarn.

Editor Textile World:

Which is the more economical to use for scouring woolen yarn, caustic potash, or carbonate of potash? Which gives the better result, irrespective of cost? Should a soda soap ever be used with a potash alkali for scouring purposes, or potash soap with a soda alkali?

Philadelphia. J. L. W.

The question put to us by our correspondent is a debatable one, and there exists quite a range of opinion among manufacturers concerning the employment of these materials. Carbonate of potash is more economical to use than caustic potash, and we should say that as a rule it should give better results. We know of cases, however, where soda soap is used with potash alkali for some purposes, and we know of cases where the potash soap is used with the soda alkali, and claims are made for each of these soaps as showing better results than the other. Of course careful attention should be given to both the quality of the soap and of the water that is used. Caustic potash is chiefly used in the preparation of soft soap, and is prepared from pearl ash by causticizing with lime, and is sold chiefly in the solid state.

Knitting Plant.

Editor Textile World:

Can you give me information concerning the necessary machines and cost for a complete factory for knitting hosiery?

Penn. G. B.

In reply we would say that the inquiry of our correspondent is exceedingly vague, as he does not state the size of the plant, i. e., the number of dozen per day required, nor does he state the gauge of goods that he wants to manufacture. Therefore he leaves it to us to suppose the plant, which we have done, by taking a plant capable of producing 100 dozens per day, 176 needle goods. A plant on half hose, exclusively, would cost him, probably, not far from $5,000., and a plant for making ladies' hose exclusively would cost rising $6,000. These expenses would cover the cost of what is known as the knitting department. The finishing department, in either case, would require a dryer, and as goods are finished to-day, it ought to have one screw, hot press, or what is commonly known as a hydraulic press, sufficiently large to take care of 500 dozen per day. This would involve an additional expense of perhaps $700. In some localities, it is not necessary for the manufacturer to buy one of these presses for his mill, as there are parties who press for the trade. We answer our correspondent very generally, because we have nothing to base our estimate on, specifically. We have some details at our command, but do not think it advisable to publish them in response to so vague an inquiry.

New Publications.

Hawaii. Alaska.—The Bureau of American Republics, Joseph P. Smith, Director, Washington, D. C., has just issued two new books, numbers 85 and 86, relating to Hawaii, and Alaska, respectively. The former furnishes information concerning the natural resources, industries and commerce of the Hawaiian Islands, in their present political status. The latter is published in response to the quickened interest in the recent discoveries of gold in the Klondike region, and the great demand for fresh and reliable information concerning Alaska.

Appleton's Popular Science Monthly—for September, 1897. New York: D. Appleton & Co. Yearly price $5.00. This number contains articles of much interest to the general reader. Among them may be mentioned the following: Spanish Experiments in Coinage: The Hawks of New England; Principles of Taxation; The Racial Geography of Europe; Objects and Results of Polar Research; The Giant Cactus, Eskimo Bows and Arrows; When Character is Formed; The Scope of Botany; Alchemy Redivivus; The Forces in an Air Bubble; The Discovery of the Sun Spots.

The Money Question—By Henry V. Poor. New York: H. V. & H. W. Poor. This is a handbook for the times, by the author of "Money and its Laws," but better known as one of the publishers of Poor's Manual of the Railroads of the United States. Mr Poor is an able writer on economic questions, and this pamphlet of 202 pages is well worth perusing. It takes up such subjects as Defining Money; Function of Government in the Matter of Metallic Money; Metallic Money of the United States; Savings Banks; Bank of the United States; Change of Standards; United States Notes; Demonetization of the Silver Dollar,—Act of 1873; Act of 1890; Position of Present Administration; Bi-metallism. The Remedy. The chief object of this work is to advocate the emancipation of the banks of the country from the burden now imposed upon them in the form of security for their circulation.

Bulletin of the National Association of Wool Manufactures—for September, 1897. Edited by S. N. D. North, Secretary, and published by the Association, Boston. This number is especially valuable on account of its authentic reference to recent legislation affecting the tariff on wool and woolens. The principal article is on "The Textile Schedules of the 1897 Tariff," written by the secretary.

Cassier's Magazine—for September. New York: Cassier's Magazine Company. Price 25 cents. This number has the usual variety of well considered and popular articles, which characterize this magazine. The leading articles are the following: The Evolution of the Wrecker, with thirteen illustrations characteristic of wrecking operations and appliances; The Future of American Shipbuilding from an American Point of View, illustrated; By-product Systems of Coke Making, being a graphic exposition of their advantages, with thirteen illustrations of retort coke oven plants; Electric Copper Refining in the United States, being a description of methods and statements of cost; An Ocean Danger and Its Remedy, referring to a new system of night signalling.

Appleton's Popular Science Monthly—for October. New York: D. Appleton & Co. Price $5.00 per year. This number contains a well illustrated article on "Franklin's Kite Experiments with Modern Apparatus;" also article on the following subjects: "The Psychology of Belief;" "Existing Methods of Taxation," by David A. Wells. It also has an article describing and illustrating science-teaching in the University of Chicago, but perhaps the most interesting paper, from a purely scientific standpoint, is the review by Prof. C. Hamford Henderson of a new book entitled "Some Unrecognized Laws of Nature."

Cotton Spinning.—By William Scott Taggart. London and New York: Macmillan & Co. Price $1.75. The second volume of this work has just been issued, and includes the processes up to the end of the fly frame, the chapters being devoted in their order to drawing, combing, and fly frame. This brings cotton spinning down to the end of what is generally termed the preparing processes, and includes all of the machinery and manipulations between the card and the self-actor, or ring frame. The operations in this section have the most important influences upon the future character of yarn, and every manufacturer should be familiar with them. The third volume of this work will deal with the spinning processes. With the advance that is being made in textile education, this work will be esteemed of much assistance to the student. Mr. Taggart is one of the contributors to this magazine, and is a young man of thirty-seven years of age, and is an Englishman. Mr. Taggart's

school education was quite thorough, especially in branches connected with the mechanical sciences, including mathematics, applied and theoretical mechanics, and steam and machine construction. He also has given much attention to art studies. He was an apprentice in the shop of the well known machine builders, Dobson & Barlow. After passing through the shop of this concern, he entered the drawing office, and remained there for a number of years. In the meantime, he earned a scholarship in the subjects above mentioned, which enabled him to attend the evening lectures for three years at the Owen's College of Victoria University. Some years ago, he entered into the services of a large American firm, as their technical adviser for the continent of Europe, and in this position he had unbounded opportunities for obtaining an experience in textile and engineering industries as they are conducted. A few years ago, he published a small book on "Sketches on Textile Machinery," for the use of students in technical schools, which was quickly sold out. Last year, Macmillan & Co. issued the first volume of the work now noticed, which is intended to be an exhaustive treatise of cotton spinning. Much of his spare time in the evening has been devoted to teaching evening classes connected with technical schools, chiefly in the Bolton District. He has given a large number of lectures to mill managers and associations in various parts of Lancashire.

Old English Embroidery: Its Technique and Symbolism.—By Frances and Hugh Marshall. London: Horace Cox, Chancery Lane. Price $3.00. This publication is very handsomely gotten up, both in regard to its typography and illustrations. Of the latter, there are 124, among which may be mentioned: The Westminster Chasuble; Bayeux Tapestry; Burial of Edward the Confessor; Munich Mitre, with Martyrdom of St. Thomas a Becket; Funeral Pall, Fishmongers' Company; Tapestry Panel, St. Elizabeth of Hungary; Tapestry of the Sixteenth Century. Its several chapters cover the following subjects: Anglo-Saxon Period; Anglo-Norman Work; Vestments of St. Thomas a Becket; The Order of Chivalry and Heraldry; The Syon Cope; Materials Employed in Mediaeval Embroidery; Domestic Embroidery of the Middle Ages; Bed Hangings of the Middle Ages; Lancastrian and Tudor Work; Embroidery on the Stump; Jacobean Work; Symbolism in Mediaeval Embroidery; Emblems and Attributes of the Saints.

Industrial News.

—The Keystone Knitting Machine Mfg. Co., of Philadelphia, have removed from 1711-15 Randolph St. to No. 40 North Seventh St., Philadelphia.

—Business with S. A. Dudley, shuttle maker, Taunton, Mass., is somewhat improved, and the outlook appears quite favorable for a good fall trade.

—The American Belt Cleaning Co., 7 Hill St., Taunton, Mass., are now doing a nice little business in making old, oily, gummy belts run as well as new. Mr. J. McGhee is the inventor of the process, and is one of the most cordial and genial of men. They are now doing considerable government work. Among their testimonials are such establishments as the Mason Machine Works, and a number of other large concerns.

—The Geb Attachment Co., formerly of Franklin, Mass., are now located at Lakeport, N. H., in the shop of the Crane Mfg. Co. This firm has the reputation of being among the very best mechanics in the State, and no doubt the Geb Attachment will be pushed with renewed vigor and success.

—The Cranston Worsted Mills, Bristol, R. I., have commenced to run until 9 P. M. They have a high reputation on fancy yarns, and deserve the success which they seem to be enjoying.

The Boston Food Fair will be held in the Mechanics Building, Boston, from October 4, to October 30, and will be the biggest and best exposition of its kind ever held in New England. Its many attractions will be unexcelled, including the grandest exhibit of food products ever seen in America, for which money will be expended; the sum of $35,000 having been spent in fitting up new halls, alone, to be used for the first time at this fair. There is to be a household department, under the charge of Mrs. A. E. Whitaker, in which demonstration lectures will be held by Mrs. Lincoln and others. In here will be seen a revival of old New England cookery, cookery of other nations, the up-to-date dining room, the latest household utensils and methods, and a living room of 1697, and besides this there will be discussions on health topics, etc. There will be a State of Maine exhibit, in charge of Miss C. T. Crosby ("Fly-Rod"). The cabin which will hold Miss Crosby's fishing and hunting treasures and trophies will be brought piecemeal from the Maine woods and erected by stalwart guides who will be at the exhibit every day. A prominent attraction will be Sousa and his band of fifty pieces, secured at much expense. There will be a bakers' department, showing working exhibits of bakers' and confectioners' machinery; bread, cake and pies baked while you wait. Enormous ovens, kneaders, and all the apparatus used by bakers, confectioners, hotels, etc. A prominent feature will be some Irish exhibits, including souvenirs of the Irish rebellion of '98; pikes and weapons used in ancient warfare; costumes of fisher folks of island or armah in Galway Bay; piece of Blarney Stone; hill of Tara with dirt from Tara; Irish fiddles and blow-pipe with dancing on Irish soil; peat and moss with implements used in cutting; Irish spinning wheel, etc.

—John & James Dobson, Philadelphia, have made a breadth of solid-color Wilton carpet, known as Mosaic, which is three yards wide. This is believed to be the widest ever turned out by an American loom—heretofore one and one-half yards has been the maximum width. The loom on which this new departure in carpet weaving was produced was conceived, designed and built by the Messrs. Dobson at their Falls of Schuylkill mills. The width of this Wilton carpet, doing away with unsightly seams, adds much to its beauty when laid, and as a floor covering is only excelled by the most expensive antique rugs.

—Dillon & Co., 20 Cedar St., New York, have an advertisement in this issue, on page 25, to which we trust our readers will give some attention should they be in want of anything in the dyestuff line.

—One of the best regulators, that has stood the test of time, for water wheels, is the Wright water wheel governor, made by J. Walter Smith, Webster, Mass.

—H. Popham & Son, Newark, N. J., manufacturers of belting, both round and flat, also raw-hide bell cord, and importers of English picker leather, has an advertisement in this issue, on page 126, to which we call the attention of manufacturers.

—The Beacon Lamp Co., New Brunswick, N. J., whose advertisement appears on page 24, manufacture incandescent lamps for all systems from 8 to 500 candle power, and wherever used have given the utmost satisfaction, so far as we can learn. Satisfaction, at any rate, is guaranteed. Their 1897 lamps are spoken of with especial favor. The incandescent lamps of this concern comprise those known as standards (multiple of all candle powers); series (arc and incandescent circuit); candle, bung-hole, candelabra, spherical, sign and decorative, lantern, surgical, dental, lighthouse; and Crookes tubes. This company pays especial attention to their method of exhausting incandescent lamps by mechanical pumps, and in no instance do they employ mercury, obtaining by their methods better results and a high degree of accuracy. Their 50 to 500 candle power lamps are highly spoken of, the filaments in these lamps being the result of special work extending over a period of years. Their series lamps, for arc light circuits, are noted for their freedom from blacking and uniformity of current consumed.

—Weimar Bros., Manufacturers of silk and cotton bindings, etc., Philadelphia, have moved their place from the N. W. cor. of Hope and Huntingdon Sts., to 1817 East York St. Their plant and the productive capacity of their factory will be considerably increased.

—Philadelphia Gas Improvement Company, of Philadelphia, Penn., are increasing their plant by erecting a new fireproof pipe shop, constructed entirely of iron. The building has steel framework and a corrugated iron covering. Contract for erecting the building has been let to the Berlin Iron Bridge Company, of East Berlin, Conn. This latter company have the contract for the new boiler house which the New York Belting & Packing Company are putting up at Passaic, N. J. The building will be entirely fireproof, brick walls, with steel roof trusses covered with anti-condensation corrugated iron covering.

—The Parks & Woolson Machine Co., Springfield, Vt., has just received the following orders: The Algonquin Co., Passaic, N. J., for an 86-inch brushing machine; The Botany Worsted Mills, Passaic, N. J., for a two-cylinder teasel gig; Sanford Mills, Sanford, Me., for a steam finishing machine; The Linwood Mills, No. Adams, Mass., for an improved two-cylinder brushing machine.

—Scott & Williams, builders of knitting machinery, Philadelphia, have moved their general office from the corner of 6th and Arch Sts. to their works, 2079 East Cumberland St., they deeming this move for the best interests of their customers and themselves, as they have a full line of their recently designed and improved hosiery and underwear machinery in the exhibition department of the Bourse. Their present location can be readily reached by electric cars in about twenty-five minutes from the centre of the city.

—The Rochester Cotton Mills, Rochester, N. Y., owned by Garner & Co., are among the oldest industries in that city. The mills were built in 1845. The old cotton mill is now owned by the estate of Wm. T. Garner, New York. It was built and owned by Seth Jones, but later became the property of a stock company. It became the Jones cotton mills in 1850. The property was purchased in 1856 by John Vickery and the mill was run by him till his death in 1863. In 1865 it was bought from the Vickery estate by William T. Garner.

—Fleming & Chapin, Philadelphia, whose advertisement appears in our advertising columns, as dealers in braids, tapes, yarns, etc., have changed their location from 215 to 229-231 Church St. They have taken the old building formerly occupied by the Philadelphia Tapestry Mills, a five-story edifice with a good basement, and altogether containing more space than the two stories which this firm formerly occupied. They will carry a greatly increased stock of their specialties. The rapid growth of this concern's business is due to the excellent quality and uniformity of the products which they handle, and the marked ability with which they are placed before the trade.

—The Mutual Boiler Insurance Co., 31 Milk St., Boston, issue policies covering damage to property and employees. Specifications giving boilers and settings are furnished, as well as expert reports on relative value of coals; steam boiler and pipe coverings; on stoking and economy in handling coal; and other matters affecting the manufacture of steam.

—Reports reach us from Oregon that progress is being made in that State, through the efforts of the Women's Flax Fiber Association, showing the successful cultivation of flax for its fiber. We cannot learn, however, that anything has got beyond experimental work in the production of samples, which are pronounced handsome and show well after being scutched, exhibiting strength and fineness, and possessing a silken feeling similar to that characterizing the best production of Europe. What the results will be when cultivation takes place on a more extensive scale, of course, we are unable to say.

—A. D. Emery, Taunton, Mass., who has so long been perfecting the Universal loom, seems now to have "got there," and the Universal Loom Company, of Taunton, Mass., have a good number of looms under construction. Mr. Emery deserves success, and we are glad to see the company under such apparently favorable conditions. Brains and patience count.

—Thos. Wolstenholme Sons & Co., Frankford Ave. & Westmoreland St., Phila., Pa., have recently purchased of C. G. Sargent's Sons, a new complete train of their parallel-motion-rake wool washers. This is the fourth order they have placed for these washers and the present train of 4 bowls will be one of the largest, if not the largest, in the country, being somewhat over 125 ft. long.

—White & Rushton, formerly of Providence, R. I., have just moved into their new shop on Barrows, near Brown St., Johnston, R. I. The shop is 38 by 78. Their business is rapidly increasing; and their new steam finishing and lustering machine, also the American compilator for worsted combs and White's patent undergrids for woolen and worsted cards, are among their specialities.

—Maris Brothers, manufacturers of traveling cranes, of Philadelphia, Penn., are erecting a new machine shop to meet the demands of their increased business, and the new building will be modern and designed to meet all the requirements of a handy and serviceable machine working establishment. The building will be 55 ft. x 75 ft. Running the full length of the building will be a ten ton power crane having a span of 30 ft. One side of the building will be arranged with a gallery on which will be placed the lighter machinery. The framework of the building is of steel, and the covering of the sides and roof will be corrugated iron. Contract for the complete building has been let to the Berlin Iron Bridge Company of East Berlin, Conn., who designed the structure, and who will furnish and erect all the material.

—Information from Texas is to the effect that earnest efforts are being made for the production of woolen goods at Waco. We learn that the woolen mills at that place are increasing their production and adding to the number of their operatives. Of the latter, there are about 500, and 100 more are wanted, according to a recent statement made by the secretary of the Waco Commercial Club.

A. Klipstein & Co.

A. Klipstein & Co., dealers and importers of chemicals and dyestuffs, New York, celebrated their 25th business anniversary recently. The success of this concern has been remarkable, due to the energy and ability of Mr. Klipstein, who is yet to attain his fiftieth birthday. Mr. Klipstein received a thorough education in Germany. At the age of eighteen he went to France and secured a position as English and French correspondent in a large seed house, afterwards going to England to accept another position of responsibility. He soon returned to France and commenced his successful career in the chemical business, taking an important position as German, French and English correspondent of the well known chemical house of Edmund, Renault & Co., Paris and Bordeaux.

At the outbreak of the Franco-German War, Mr. Klipstein entered the employ of the wholesale drug firm of Gehe & Co., Dresden, but after the war was over he returned to the employ of Edmund, Renault & Co., who became so well convinced of his ability that they sent him in 1872, to the United States to introduce their chemicals, where he established a business in New York City under his own name. Since Mr. Klipstein's advent in the chemical business in New York, he has enlarged his quarters from time to time to meet the demands of his increasing trade, and bought the fine building 122 Pearl Street, New York, which contains one of the finest laboratories, in which his firm makes all of their experiments with dyes and chemicals. The firm name was changed in 1894 to Klipstein & Co., corporation, Mr. Klipstein becoming president; W. H. Jackson, vice president; and E. C. Klipstein, treasurer. The firm has large branch offices in Philadelphia, Boston, Chicago, Cincinnati, Providence, and Hamilton, Ont.

Textile Machinery at the Philadelphia Bourse.

There is now installed in the exhibition rooms of the Philadelphia Bourse a very interesting exhibit of textile machinery, in charge of Mr. J. Calvin Hess. This will be in operation during business hours, and affords an excellent opportunity for local manufacturers, as well as visitors, to inspect the different lines in a most convenient place. Among the lines in Mr. Hess's charge is a complete exhibit from Scott & Williams, of underwear, hosiery and golf knitting machines; John W. Hepworth, looping machines; F. H. Pownal Iron Works, dye house and finishing machines, stocking dryers and steam presses; Standard Sewing Machine Co. and Excelsior Sewing Machine Co., mill sewing machines. Schaum & Uhlinger have a line of hydro-extractors; Lewis Jones, brushing and fleecing machines. Besides the strictly textile exhibits, Mr. Hess has charge of J. H. McGowan's pumping machinery; White & Middleton, gas and gasoline engines; Eddy Electric Co., motors and dynamos; Geo. V. Cresson Co., power transmiting machinery.

To the Garden of the Gods.

New Hampshire's mountain ranges, the famous White Mountains, stand foremost as the most beautiful scenic ground in the world. It is a very wide territory that these majestic peaks and uplands cover, and their widely varying attractions are a never failing source of enjoyment. Every locality has its own distinct features, and the tourist can spend weeks in observation, never tiring, so absorbing and interesting are these ever changing charms. Bethlehem lays particular stress upon its wonderful atmosphere; so dry and clear it is that hay fever victims find it a most desirable abiding place. Its location is superb, commanding a fine view of Mt. Washington and the Presidential Range, of the beautiful Franconia Mountains, and for that matter every peak and place of note is easily discernible. That the gem of localities in the vicinity of Echo Lake is an ideal spot and it is no wonder that "The Old Man of the Mountains" chose this as his abode, for everything hereabouts is decidedly beautiful. Franconia and the Flume, Fabyans and the Mt. Pleasant House, Crawfords and Twin, Jefferson and Lancaster, The Summit and a score of other resorts, abound in interesting sights, and in every direction lead paths and drives revealing unexpected and astonishing surprises. Cascades, waterfalls, picturesque nooks and beauty spots are everywhere, and in fact the whole White Mountain region is beautiful enough to have been the "Art Garden of the Gods." To Oct. 9 the Boston and Maine Railroad will sell reduced rate tickets to all principal mountain points, from its principal stations. These tickets provide for various routes, and side trips may be taken from Fabyans and Bethlehem Junction at reduced rates. For information inquire at ticket offices.

Raw Silk Machine Wipers.

Alert manufacturers who watch the wear of their machinery can score a valuable point by discarding rags and waste and adopting the raw silk machine wipers made by the American Silk Mfg. Co., of Philadelphia, for cleaning their machinery. These wipers (announced on

page 126) are supplanting the old method of machine cleaning and are securing the general endorsement of progressive mills, factories, electrical plants, bicycle and furniture manufacturers. They are recommended by the Board of Underwriters of Philadelphia and St. Louis, for being absolutely free from the danger of combustion and ignition. The raw silk fabric is smooth and pliable yet is well napped and strongly woven. Users say that this wiper leaves no troublesome lint in the fine parts of the machinery and, being capable of oft repeated use, is surprisingly economical. It is easily cleaned by a compound supplied by the manufacturers, and the only process of cleaning necessary is to soak over night and rinse out the following morning. At the annual meeting, last year, of the N. E. Cotton Mfrs. Association, testimony was given by a manufacturer of experience, showing the value of raw silk machinery wipers as compared with the usual unclean and combustible waste.

Oils and Mill Supplies.

The advertisement of the well known mill supply house of Stevenson Bro. & Co., Philadelphia, will be found on page 126 of this issue of the "Textile World." For thirty years this firm have had extensive dealings with the mills of the Middle and Eastern states and have of late years supplied many of the mills and factories of the South. Their specialities are Valvine, cylinder oil, engine and machinery oil, album oil for sewing machines and fine machinery, petroleum and fusel oil; steam packing of all brands, belting, laces and belt dressing, paraffine wax, bayberry wax, rod wax, beeswax, cosmetic, and anti-lamina for removing scales from steam boilers. Stevenson Bro. & Co. control a refinery and have their city warerooms and office at 132 S. 2nd St., Philadelphia. The business was founded by Jas. H. Stevenson, who continues actively at its head.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Montgomery. Work was started in the People's Cotton Factory, Sept. 1. A test was made on the machinery Aug. 28, which proved thoroughly satisfactory. T. L. Jones is secretary and treasurer.

—Georgia, Graniteville. The mill of the Warren Mfg. Co., which is being erected at Aiken Junction is rapidly approaching completion. After great speculation as to what work will be done in the mill, it has been decided to manufacture print goods. If so, the mill will probably be equipped with the Draper looms, which have been installed in many of the new mills.

—Maryland, Harve de Grace. The mill of M. Gambrill & Co., of Bank, Md. (RR Station, Baldwin, Md.) has been moved to this place. Table cloths and goods of similar character will be manufactured. It is expected to have the plant in operation in a short time, giving employment to several hundred hands.

—North Carolina, Mayodan. A report states that Messrs. Fries of Salem, N. C., who are among the largest stockholders of the Mayo Mills, contemplate the erection of another mill to be known and operated as Mills No. 2 of the same company.

—North Carolina, North Wilkesboro. It is reported that a new woolen mill will probably be built here sometime during the present year. Mr. G. W. Hinshaw of Winston, N. C. is at the head of the enterprise, and it is said that the major portion of the capital to be invested will be furnished by New England men.

—*North Carolina, Troy. The Smitherman Cotton Mills are expected to start up about Jan. 1, 1898. This mill was reported by us as projected early in 1896. They will need 2500 spindles and 100 looms at the start, and more will be put in as the success of the enterprise justifies. They will manufacture sheetings.

—South Carolina, Catawba Falls. A report states that the State's interest in the water power at Catawba Falls has been deeded to Mrs. Susan A. Boyleston, who owns the surrounding property, in order to enable her to sell all the property to a syndicate of capitalists, who intend developing the power electrically and building a cotton manufacturing plant at a cost of $150,000.

—*South Carolina, Winnsboro. The Fairfield Cotton Mills, which we reported previously would begin operations Nov. 1, will start a month earlier. The machinery, which is now being installed, is being superintended by the D. A. Thompkins Co. The capital stock is $100,000.

Enlargements and Improvements.

—Delaware, Henry Clay Factory. The machinery of the Barlow and Thatcher plant has been sold to the Coosa Mfg. Co., Piedmont, Ala., and it will be removed before November 1, and added to the present plant of the Coosa Company. Both Mr. Thatcher and Mr. Barlow are connected with the Coosa Company.

—*Georgia, Augusta. George Estes, president of the John P. King Mfg. Co., informs us that their new addition will be completed by Jan. 1, 1898. This will give them 20,096 new cotton spindles and 600 new looms, and the total improvements will cost $300,000.

—Georgia, Augusta. The Sutherland Mfg. Co. have placed orders for about 4,000 additional spindles.

—Georgia, Jackson. It is reported that the Pepperton Mill is to enlarge its capacity by the addition of about 40 looms, and 1500 to 2000 spindles. The principal product is sheetings.

—Georgia, Whitehall. The Georgia Mfg. Co. have their new water power completed 1½ miles below their factory, and expect soon to put in a new water wheel, and by means of electric wires transmit the power to the factory. They are to add new machinery this fall.

—New Jersey, Millville. The cotton mill and bleachery of the Millville Mfg. Co. have started up, and expect to run full time. An addiaion will be built to the mill, giving employment to several hundred more operatives.

—North Carolina, Burlington. Additions including the erection of a dye house, are being made to the plant of the Aurora Cotton Mills. All the mills in this place are now running on full time.

—North Carolina, Graham. The Oneida Mills will install 4,000 or 5,000 spindles with the accompanying machinery as soon as it can be ordered and is received. It is said that the carding and spinning have been insufficient for some time and consequently all the looms have been unable to keep steadily at work owing to the short supply of warps, etc.

—North Carolina, Greensboro. The Proximity Cotton Mills will add 100 more looms to their plant.

—Pennsylvania, Chester. It is reported that Galey & Lord Mfg. Co. will make an extension to their plant in order to give room for a number of additional looms. This will give employment to about 150 more hands.

—Rhode Island, Pawtucket. The Loraine Mfg. Co. has started raising part of their plant, 3 stories. When completed the entire mill will be 4 stories, and considerable space will be gained which will be filled with new machinery before long. The yarn department is now running till 9 P. M.

—Rhode Island, Pontiac. B. B. & R. Knight are to build a large cotton storehouse in this place. It will be three stories high, built of brick, and 200 feet long.

—*South Carolina, Greenville. F. W. Poe Mfg. Co. informs us that they started work Sept. 2 on an addition 130 feet long, four stories, which they expect to complete and have in use by Jan 1, 1898. This will give employment to about 175 persons, and will provide an increased capacity of 15,000 spindles and 304 looms.

—South Carolina, Marion. The Ashby yarn mill at this place, formerly the Marion Cotton mills, is to have its capacity doubled, and new machinery added some time this month. This mill was bought the latter part of 1896 by Messrs. A. M. Price of Lincolnton, N. C. and R. A. Blythe of Philadelphia.

—Virginia, Danville. The Riverside Cotton Mills will erect an addition to their dye house, 75 x 120, 2 stories high. They will install in the new addition more raw stock dyeing machines, 6 hydro-extractors, 2 textile drying machines, and 2 baling presses.

Mills Starting Up.

—Alabama, Columbia. The Columbia Cotton Mills resumed operations Sept. 6, after a shut down of five weeks, during which time extensive repairs have been made to the plant.

—Connecticut, Norwich. Work was resumed Sept. 2, in the carding department of the mill of the Falls Co. The entire mill, which was closed down Aug. 14, for repairs, was started up Sept. 6.

—Maine, Biddeford. Agent McArthur of the Laconia & Pepperell Cotton Mills at this place has given information to the effect that Mill No. 3, which has been closed down every other week for several years, commenced Aug. 30, to run without any interruptions. This mill, which is the largest one owned by the corporation, employs about 700 hands.

—Maine, Saco. The mills of the York Mfg. Co. which have been shut down for six weeks, resumed operations in full Sept. 7, giving employment to about 1500 hands.

—Massachusetts, Chicopee. The Dwight Manufacturing Co. which has been running but one of its mills for some time, mills No 2 and 3 being idle since the first of June, resumed operations Sept. 6, with the full compliment of 1600 hands.

—Massachusetts, Chicopee Falls. Work was resumed on full time Sept. 20, at the plant of the Chicopee Manufacturing Co. after a complete shut down of three weeks, giving employment to 1200 hands.

—Massachusetts, Farnumsville. The Farnumsville Cotton Mill, which has been idle for over a year, has been leased by Messrs. A. G. Kempton and J. M. Harvey, who will put it in operation soon. Work will start at once putting the machinery in running order. All the former overseers, except the boss weaver, who has secured a position in Lonsdale, R. I., will resume their old places at the mill. When in operation the mill will give employment to 175 hands.

—Massachusetts, Holyoke. The Lyman Mills started operations on full time Sept. 7. The plant employs some 1300 hands. For the past six weeks but one of the Company's four mills has been in operation.

—Massachusetts, Lawrence. Work was resumed Sept. 2, in the picking, dyeing and carding departments of the Everett Mills. The other departments commenced work the 7th. During the shut down since July 30, new boilers have been installed. There are 1200 hands employed.

—Massachusetts, Lawrence. After a shut down of four weeks, the Atlantic Mills resumed operations August 30. About 1200 hands are employed.

—Massachusetts, Taunton. The Cohannet Mills which were closed down during the depression, have resumed operations.

—New Hampshire, Peterboro. After a four weeks shut down the Phenix Factory started operations Monday, Aug. 30.

—North Carolina, Charlotte. The Crowley Mfg. Co. whose mills have been shut down, have resumed operations in full.

—*North Carolina, Charlotte. The new Louise cotton mill has begun operations. This is the twelfth cotton mill in this place.

—Virginia, Petersburg. The mill of the Matoaca Mfg. Co., which has been closed down since June, has been started up. When running full time it employs over

200 hands, it is said that the same scale of wages will be in force as when the mill closed down.

Woolen.

New Mills.

—Kansas, Topeka. J. F. McAfee of Independence, Mo., formerly of the firm of McAfee &McCoy, has submitted a plan to the Commercial Club here for the establishment of a woolen mill. $10,000 will be invested in the business by Mr. McAfee himself, and $6,000 more will be needed to start the enterprise. It is thought by the club that some man in Topeka can be induced to take the entire amount. A committee has been appointed to take charge of the plan.

—Massachusetts, Blackstone. Charles Fletcher, who owns and operates the Fletcher Mills in Olneyville, has purchased the Nos. 1 and 2 woolen mills in this place, which have been idle for nearly five years, and will put in worsted machinery for the manufacture of worsted yarns, and build a large weave shed for weaving worsted goods.

—New Hampshire, Meredith. Wendell Bros., of Methuen, Mass., will remove their yarn manufacturing business to this place October 1.

—Pennsylvania, Chester. Plans for the reorganization of the Mallison Mills, under the name of the Lansdowne Mfg. Co., which have been under way for some time, are about completed, and the money necessary has been about all subscribed. The new company will operate the mill at 10th St. & Morton Ave., and it is expected that within two weeks over 200 hands will be employed. The mill has been idle for over a year.

—Pennsylvania, Hulmeville. F. Rumpf & Sons of Philadelphia, contemplate the erection of a $35,000 woolen mill here. The firm has agreed to erect the building if the local capitalists will build a sufficient number of houses to accommodate 250 employees. The town is now considering the matter.

—Pennsylvania, Philadelphia. Baltz Bros. have started to operate a portion of the Ripka Mills in Manayunk making carpeting and cloaking yarns. They also contemplate making extensive changes and adding new machines in a few months but are not yet prepared to give particulars.

—Pennsylvania, Philadelphia. Taylor Bros., of Germantown are to erect a two story mill, 100 x 25 feet. Architect R. L. Perot, who has completed the plans, is now receiving estimates for the same.

—Pennsylvania, Philadelphia. Wm. F. Davis has just started a mill in Manayunk, the Missouri Mills, Main and Chestnut St., to produce woolen yarns. He will make a specialty of carpet and rug yarns. The plant contains 3 set cards and 504 spindles. He sells direct and does his own buying.

Enlargements and Improvements.

—Connecticut, Stafford Springs. Additional machinery is being installed in the plant of the Central Woolen Company. This is owing to the company's inability to supply its looms with yarn to keep them in operation.

—Indiana, Mishawaka. The foundation for the Mishawaka Woolen Co.'s new building is being laid.

—Massachusetts, East Brookfield. Winfield Scott, proprietor of the lower satinet mill, is setting up 16 looms, 1 set cards and jack in the building formerly occupied by Rouselle & Moreau, and expects to have them running about Oct. 1, giving employment to about 20 additional hands.

—Masachusetts, Hyde Park. The Robert Bleakie Mfg. Co., is installing considerable new spinning machinery. The mill is also being equipped with an electris light plant.

—Pennsylvania, Norristown. The large addition, 25 x 22 feet which is being built to the carpet plant of which James W. Barker is proprietor, is nearly completed. The firm has changed 29 machines used for making upholstery for others to manufacture Brussels carpets. There are 200 hands employed.

Mills Starting Up.

—Massachusetts, Dalton. The Glennon Mills, which have been leased by the Hampden Woolen Company of Hampden, Mass., has been thoroughly renovated. New material has been installed for the manufacture of fancy cheviots and cassimeres. A new picker plant and boiler have been built in the rear of the main building. Some 200 hands will be employed when all the machinery is put in. Operations have already begun in the plant.

—Massachusetts, Pittsfield. The old Pomeroy Mills which we reported had been leased by the Pontoosuc Woolen Co., have been started up in the manufacture of dress goods. There are now about 100 hands employed.

—Massachusetts, Wales. Operations have been resumed in the mill of the Excelsior Woolen Co. after a shut down which lasted all summer.

—New Hampshire, Ashuelot. The West Swanzey Mfg. Co. have started up a part of their mill. The mill has been closed since early last fall. It will be run to its full capacity as soon as the sale of the product will permit.

—New Jersey, Bridgeton. The East-Lake Woolen Mills, which have been idle for about three years, are expected to resume operations soon.

—New Jersey, Camden. It is reported that operations will be resumed in the old Camden Woolen Mills at 10th. & State Sts. Title to the property is reported to be now vested in Supt. Bodfish, who operated the plant at the time of the Company's failure.

—Rhode Island, Bridgeton. Mr. Samuel Mellor, proprietor of the Stone worsted mill, Parcoag, has secured a lease of the Clear River woolen mill at Bridgeton for five years, and will move his machinery from his present quarters and begin work at Bridgeton about Oct. 1. The Stone mill is owned by Horace Kimball, and has been operated by Mr. Mellor for several years. He will have double the number of looms, and will do carding and spinning in the new mill.

Arthur Graves is superintendent. A general line of fine worsted yarns will be made. This plant has been idle for nearly two years.

—Rhode Island, Warren. The worsted mill of the Warren Woolen Co. has been sold to some of the stockholders of the Woonsocket Worsted Mills, and will be known hereafter as the Stafford Worsted Co. The new company will take possession at once, and the mill will be started as soon as some new machinery is added and some repairs made. The number of operatives will be about 160.

—Vermont, North Hartland. The Ottaquechee woolen mills, which have been shut down since April, have started up.

Knit.

New Mills.

—Indiana, Michigan City. It is reported that the officers of the Lakeside Knitting Works have been offered inducements by the cities of Elwood, Muncie, Anderson, Kokomo, to have them locate their mill in one of their cities. A change of location is made necessary on account of a law recently passed by the legislature prohibiting convict labor, and as have a contract with the prison committee which expires soon, they must look elsewhere for help. The company employs over 400 in the prison and out. A committee of citizens has been appointed to confer with the managers, and see if arrangements cannot be made for them to remain here.

—Massachusetts, Southbridge. Messrs. Frank H. Foley and Joseph Hagerty have engaged in the manufacture of knit hosiery in Delhanty's Block, under the firm name of Foley & Hagerty. The firm has produced a number of samples which have been first class in every way.

—Massachusetts, Wakefield. A large vacant lot of land at the corner of Albion and Foundry Sts. has been purchased by Messrs. Winship, Boit & Co., proprietors of the Harvard Knitting Mills, for the purpose of erecting a three story, brick factory, 182 x 50 feet. Contract for preparing the foundation and erecting the building has been let to Roger Howard. It is expected that the factory will be completed about the latter part of January, when the company will remove to its new quarters. They are now in Wakefield's Block.

—New York, Elmira. Sept. 1st, the property of the Elmira Woolen Mills was sold to the Seamless Hosiery Co., of Rochester, N. Y. Mr. C. E. Bruce, president of the company, will improve the property to meet the requirements of its business. It is expected to have the plant in operation by January '98. This company has been operating its plant in the Monroe County Penitentiary, employing over 300 hands. Machinery will be moved from Rochester.

—New York, Oriskany Falls. Ground has been broken for a large knitting mill, and the work will be rapidly pushed. It will be built partly on the site of the old mill of E. B. Woolworth & Co. which was burned several years ago. The owners will be Quentin McAdams of Utica, and the members of the Oriskany Falls Knitting Co. The main building will be of brick, 45 x 100, three stories and basement. It is expected that the mill will be in operation by January, and that from 150 to 200 hands will be employed.

—*Ohio, Piqua. The co-partnership between John P. Spiker and George Davidson will be known as the Superior Underwear Co., of which Mr. Davidson will be superintendent. They expect to start production Oct. 1, employing about 20 people. They will operate by gas engine, and use three knitting machines, making men's fine ribbed underwear.

—*Vermont, Jonesville. R. J. Robinson, writes us that his mill is at Jonesville, and is a branch of the Baker Underwear Co. of Peekskill, N. Y. He is the manager of this plant, and employs about 50 hands, making children's underwear.

Enlargements and Improvements.

—Connecticut, Middletown. The Russell Mfg. Co. have about completed their new factory building, at a cost of $10,000. The new building is of brick, 136 x 48, two stories high, with basement. Employment will be given to 100 hands. It was expected to start work in the new building the latter part of September.

—Delaware, Wilmington. The new addition to the factory of the Wilmington Hosiery Co. on Front St. has been completed, and fitted with machinery, and is occupied.

—Michigan, Muskegon. Owing to an increase in business the Amazon Hosiery Company has a force of 100 additional hands, there now being over 800 hands employed in the plant.

—North Carolina, Newburn. The Clermont Knitting Mills Co. have removed their plant and business to a new and larger building, (two stories high, 310 x 80 feet. The capacity will be doubled.

—Ontario, Paris. The Penmon Mfg. Co. (knit goods), are making extensive additions to their mills, by fitting up the large building formerly occupied by the Maxwell Mfg. Co. These enlargements will cost $35,000 to $40,000.

Mills Starting Up.

—Georgia, Athens. Several new knitting machines have been added to the Athens Knitting Mill. It has become necessary to run the mill until late at night, to fill the orders on hand and those coming in.

—Minnesota, Mankato. The Mankato Knitting Mills have resumed operations after a shut down of a month, giving employment to 59 hands. A profitable season is anticipated by the company.

—New York, Cohoes. The Mohawk River Mill, Akin and Davitt, owners which has been idle for nearly a year, will soon be started in full.

—New York, Cohoes. Work was resumed in the Globe Knitting Mill No. 2 last month under the management of Geo. W. Kavanaugh, one of the principal owners of the concern. After the failure of A. Leroy & Co. this mill was turned over to Mr. Kavanaugh and other large creditors.

—Pennsylvania, Linwood Station. The Riverview Knitting Mills are being put in order, preparatory to starting up. This plant gives employment to about 75 hands when running on full time.

Silk.

New Mills.

—Connecticut, Middletown. It is expected that the new silk factory being

erected in this city by James Miller will be in operation by the first of October.

—New Jersey, Paterson. Joseph Nightingale's new silk mill is almost completed. Work is now under way of putting up the looms. The building is a frame structure 50 x 100 feet and employment will be given to a large number of weavers. Dress and tie goods will be manufactured.

—New York, Port Jervis. Duffy Bros., silk manufacturers of Fort Plain, N. Y., have purchased the old stone grist mill property and will remodel the building, taking possession of the same about October 1. There will be about 200 hands employed in the mill.

—New York, New York. Louis Bedell, manager of the silk department of Victor & Achelis, Leonard St., has gone to France to make arrangements with Alexander Giraud of Giraud & Co., silk manufacturers at Lyons, to establish a large plant in this city. Until the passing of the Dingley tariff this firm manufactured its stock at Lyons for American consumption.

—Pennsylvania, Allentown. Willenbaugh & Co., silk manufacturers of Brooklyn, have bought land and will erect a silk mill at the corner of Gordon & Front Sts. The main building will be of brick, 148 x 150 feet, three stories high and will employ 400 hands.

—*Pennsylvania, Quakertown. The Eagle Silk Company of New York, is the promoter of the new silk mill which will be built here. Work will be commenced at once on the erection of a building 145x45 feet, at a cost of about $20,000.

—Pensylvania, Scranton. Work will be commenced shortly on the erection of the new silk mill to be built here by Messrs. Rieling, Schoen & David. Plans for the same have been prepared by Percy J. Morris. There will be about 350 hands employed in the plant.

Mills Starting Up.

—Connecticut, Willimantic. Mrs. S. A. Bottum is preparing to start up her silk mill, which has been idle about three years.

—Pennsylvania, Catasauqua. Owing to a large demand for orders, the Wahnetah Silk Co. has put on a full force at fourteen hours and also a night force.

—Rhode Island, Westerly. It is expected that the silk plant of John W. Conant on Main St., which as been idle for the past few months, will be started up about Oct. 1. This industry will furnish employment to about 40 persons.

Miscellaneous.

New Mills.

—*Pennsylvania, Chester. Birkin & Co. manufacturers at Nottingham, Eng., have bought the property at 3rd and Clayton Sts., and a two-story brick lace mill, 225x60 feet, will be erected. Contract for building the mill has been let to Geo. Whittaker of So. Chester, and it is expected to have the new plant in operation by Jan. 1, when it will be run similar to the one at Philadelphia, with a night and day force. About 300 hands will be employed.

—Pennsylvania, Philadelphia. John M. Schwehm has opened a factory for the manufacture of upholstery goods and hair cloth, at 13-15 Wistar St., Germantown. He has installed 132 looms and built a new dyehouse. Mr. Schwehem does his own buying.

—Connecticut, Bridgeport. There is a rumor that the plush works of Lester Bros., large English manufacturers, will be moved to this country and located at Bridgeport. This would give employment to upwards of 2000 hands, and would be one of the largest plush mills in this country.

—Pennsylvania, Philadelphia. A. Dorfner, 13th St. & Girard Ave., will build a three story building on N. Broad St., to be used as a dyeing establishment.

Enlargements and Improvements.

—Massachusetts, Fall River. A two story brick addition, 140 x 55 feet will be built by the Fall River Bleachery. A new store shed, 200x120 feet, will also be built, and will be equipped with the new trolley system of packing cloth. It is expected that the building will be completed by December.

—Rhode Island, Providence. The Providence Dyeing, Bleaching & Calendering Co. on Valley St. are enlarging one of their buildings. They have put on an extra story, which gives additional floor space of 102 x 38 feet.

Mills Starting Up.

—Illinois, Peoria. The Peoria Cordage Co. is to resume operations. It has been closed down for a month.

—*Pennsylvania, Stroundsburg. The new carpet factory, under the management of Geo. H. Harvey, of the Gobelin Tapestry Co., of Philadelphia, has begun operations here.

Fires.

—Massachusetts, North Adams. Fire in the cotton storehouse of the Arnold Print Works caused a loss of about $4,000. It is not known how the fire originated.

—Massachusetts, Williamsburg. Fire in the Hampshire Woolen Mills Co.'s plant caused a loss of from $800 to $1000, which is mostly on the two picking machines. Loss is partially covered by insurance.

—Pennsylvania, Philadelphia. The three story building on Penn St. and the Reading R. R., occupied by West & Larkin as a hosiery mill, has been totally destroyed by fire. Loss on machinery and stock estimated at $4,000. Fully covered by insurance.

Facts and Gossip.

—A report states that the firm of Riel and Mullin, English silk manufacturers, have sent a representative to this country, for the purpose of investigating the field for establishing a silk plant here.

—It is reported that Robert Stehli, head

of the firm of Stehli & Co., manufacturer of silk in Switzerland, is coming to this country in October to establish a plant here on account of the tariff duties. Details have not yet been arranged and it is not known where the plant is to be located. Edward M. Barlow is the New York representative of the company.

—India, New Albany. At the October term of the Floyd Circuit Court an effort will be made whereby the New Albany Woolen Mills will be put in operation. These mills are the largest west of Philadelphia. If no agreement is made by the bondholders, it is the intention to sell the plant to the highest bidder and then form a company to operate the plant. It is said that were it not for the disagreement of a few of the bondholders, the plant could be operated now at a profit.

—Maine, Biddeford. Forty-eight new and improved cards are being installed in the mill of the Laconia Co. to take the place of 200 old ones.

—Massachusetts, Blackstone. The satinet mill of A. E. Armstrong, which has been leased by James Kilty and Lawrence McCann, will be known as the Kilty Woolen Company, and the finest grades of goods will be manufactured. There will be about 30 employed at the starting of the mill, and the number will be increased as the business demands. Mr. McCann will be manager of the mill. Mr. Kilty is interested in several other plants and will not sever his connection with them.

—Massachusetts, Franklin. The Franklin Cotton Manufacturing Company inform us that nothing definite has been done toward selling the machinery in the Unionville Mill. The machinery has been for sale for some time, but there is no immediate prospect of the mill being started up.

—Massachusetts, Hinsdale. Owing to a large number of orders received, the Hinsdale Woolen Co. has leased one of the old Plunkett Mills. They are now running steadily on fancy cassimeres and kerseys for overcoatings and suitings.

—Ohio, Cincinnati. W. C. Cochran, assignee Henry Pearce's Sons cotton mills, has been authorized to make payment of 10 per cent. to the general creditors on their claims. The Pearce, Atkins Co. creditors will receive another dividend within a month of 10 per cent., which will make 30 per cent. the business has paid since it has been under the management of the assignee.

—Pennsylvania, Philadelphia. The firm of Woodcock, Hall & Co. (knit goods), Mill and Cumberland Sts., Germantown, has been re-organized as Woodcock and Kinzel. Mr. Kinzel succeeds Mr. Hall, who has retired.

—Pennsylvania, Philadelphia. The officers of the Continental Mills, Germantown are now as follows: James Dobson, president; Wilson H. Brown, treasurer; Everett H. Brown, secretary.

—Pennsylvania, Philadelphia. It is reported that arrangements have been made for the purchase of the Glenmore Worsted Mills by some local parties, and that a transfer of the property will soon be made.

—*Rhode Island, Central Falls. The addition now building to the Farwell Worsted Mills, F. S. Farwell, owner, will contain 75 new looms and four sets of new cards. The mill will employ 150 to 200 or more hands, and will run on fancy worsteds and mens' wear.

—Virginia, Bedford City. The plant of the Liberty Woolen Manufacturing Co., will be sold at auction Wednesday, Oct. 6, for the commissioners, W. D. Coleman, S. V. Southall, J. Singleton Diggs, and M. P. Burks, by auctioneers Jno. Stewart Walker & Co.

—Connecticut, Madison. The Lenox Knitting Company, a recently organized company, has succeeded to the business of H. J. Griswold. Twelve machines will be run in the manufacture of golf hose. The company, which is owned by Messrs. Mendel & Freedman, have an office at 772 Chapel St., New Haven.

—Georgia, Columbus. Mill No. 1 at the Eagle & Phenix plant is now running night and day.

—Massachusetts, Millbury. The Lapham Worsted Mill, which was recently bought by E. F. Lane of Batcheider & Lane, is reported to have again been sold to E. B. Mayo of Foxcroft, Me., and Thomas C. Curtis of Deering, Milliken & Co., Boston. It is stated that the new purchasers will change the production of the mill from woolen goods to cotton warp, and it is expected that the plant will be started before long.

—Massachusetts, Pittsfield. Gilbert West has bought the Barker Woolen Mill. It is thought that repairs will be made, and the mill started up before long.

—Massachusetts, Wilkinsonville. It is now stated that the Sutton Woolen Co.'s plant at this place, owned by H. N. Slater of Webster, will not be again operated. This plant gives employment to 250 hands.

—North Carolina, Lincolntop. The Laboratory Cotton Mills are now running night and day.

—Pennsylvania, Spring City. The hosiery mill of W. C. Urner & Co. was damaged by water to the extent of $1500, by the opening of an automatic fire extinguisher.

—*Rhode Island, Westerly. The plant of the Wm. Clark Thread Co. commenced running with a night and day force Tuesday, Sept. 21.

—Rhode Island, Woonsocket. The carding, spinning and twisting rooms of the Lippitt Woolen Co. are now running until eight o'clock, on account of large orders.

—South Carolina, Columbia. The Richland Cotton Mill at this place is now running on full time.

—South Carolina, Greenville. The Hugenot Mills will start on night work the 27th inst. The plant has been running 11 hours a day, and it will now run 10 hours a day and 10 hours at night.

—South Carolina, Greer Depot. W. W. Burgess, president of the Victor Mfg. Co. has resigned, and L. W. Parker has been elected president. It is expected that the capital stock will be increased from $150,000 to $200,000.

—Tennessee, Memphis. The Bluff City Cotton Mill was bought Sept. 15, at trustees' sale by John Johnson and Austin Miller, two of the bondholders, for $30,000. This property cost $280,000., including buildings, machinery, and land. Mr. Johnson states that it is not their purpose to operate the plant, but they expect to sell to parties who will put it in operation, although a prospective buyer is not yet in sight.

—Texas, Lodi. It is reported that W. H. Erambert is interested in the enterprise for the erection of a $50,000 co-operative cotton mill here.

PERSONAL RECORD.

Cotton.

—Henry Robinson has accepted a position as overseer of carding at Newark, N. J. He was formerly overseer of carding in the Greene & Daniels Co.'s Mill at Pawtucket, R. I.

—Mr. Thompson succeeds Henry Robinson as overseer of carding at the Greene & Daniels Co.'s mill at Pawtucket, R. I.

—W. K. Parker, of Goldsboro, North Carolina, has accepted the general management and agency of the Wayne Cotton Mills. It was incorrectly stated recently that he had become superintendent of those mills.

—J. C. Cain is now superintendent of the Monroe Cotton Mills, Monroe, N. C.

—Melvin P. Brown, who has lately been in charge of both the carding and spinning departments of the Exposition Mill No. 1, Atlanta, Ga. will hereafter take charge of only the carding room.

—Samuel Cole has accepted a position as boss carder for the Massachusetts Cotton Mills, Lindale, Ga.

—Robert Wilson, Jr., has accepted a position as second hand in the Dwight Cotton Mills, Alabama City, Ala. He was formerly carder at the Edna Cotton Mills, Reidsville, N. C.

—James Goodroe has resigned his position as carded and spinner at the Pepperton Cotton Mills, Jackson, Ga., to accept a position as overseer of spinning in the Exposition Mill No. 1, Atlanta, Ga.

—T. A. Capps has succeeded W. A. Matheson as president of the Toccoa (Ga.) Cotton Mills.

—Thomas Jarret has accepted the position of overseer of the cloth room of the Meridian (Miss.) Cotton Mills. He was formerly boss weaver at the Matthews Cotton Mill, Selma, Ala.

—J. E. Shaw, has returned to Rockingham, N. C., as overseer of weaving at Steele's Mills. Mr. Shaw was with this company previous to his accepting the position with the Durham (N. C.) Cotton Mfg. Co.

—William A. Brown has resigned his position as an overseer in the Lorraine Mfg. Co's plant at Pawtucket, R. I.

—P. L. West is now overseer of spinning at the Eufala (Ala.) Cotton Mills. He was formerly at Lincolnton, N. C.

—Geo. W. Wright has accepted a position with the Iron Works Mill No. 3 at Fall River, Mass. He was formerly with the Durfee Mill No. 2, Fall River, as boss weaver.

—W. I. Woodward, formerly overseer of the spinning room at the Lincolnton (N. C.) Mills, has accepted a position as superintendent of the Elm Grove Cotton Mills, Lincolnton.

—W. E. Redd, formerly at the Spartan Mills, Spartanburg, S. C., is now holding a position as boss weaver with the Saxe Gotha Cotton Mill, Irene, S. C.

—John Sullivan has resigned his position as superintendent of the Achushnet Mills at New Bedford, Mass.

—Calvin Whitten, has accepted a position as overseer of the cloth room at the Spartan Mills, Spartanburg, S. C. He was for 11 years with the Riverside Cotton Mill, Danville, Va., and for the past 3 years overseer at the Asheville Cotton Mills, Asheville, N. C.

—George R. Matthews, who has been boss weaver at the Muscogee Mills, Columbus, Ga., has gone to the Eagle & Phenix Mills, and taken a position as loom fixer, with T. W. Tilman as weaver.

—J. M. Parker has accepted a position with the Toccoa Cotton Mills, Toccoa, Ga. He was formerly with the Union (S. C.) Cotton Mills as superintendent.

—J. F. Gainer of Nashville, Tenn. has taken a position at E. M. Holt's plaid mill, Burlington, N. C.

—William Allen, who has been with the Clifton (S. C.) mill, is now with the Tucapau Mills, Wellford, S. C.

—Alfred Barnes, formerly with the Dixie Cotton Mills, LaGrange, Ga. has a position with the Eagle & Phenix Mills, Columbus, Ga.

—John Kniveton has taken a position as overseer of weaving in the Edna Cotton Mills, Reidsville, N. C. He was formerly with the Sibley Mills, Augusta, Ga.

—C. A. Hodges of Laurel Hill, N. C. has taken a position with the McColl (S. C.) Mfg. Co.

—O. A. Reeves has accepted a position with the Gaffney Cotton Mills, S. C. He was formerly with the Newberry (S. C.) Cotton Mills.

—J. E. Williamson, formerly supt. of the Ossipee Cotton Mills, Elon College, N. C., has resigned his position, and

gone to Spartanburg, S. C., and taken the superintendency of the Beaumont Mfg. Co.'s mills.

—H. P. Torrance has resigned as assistant spinner at the Lynchburg, Va. Cotton Mills, on account of ill health.

—Fred A. Cumnock has resigned his position as superintendent of the Exposition Cotton Mills, Atlanta, Ga.

—J. R. King, formerly with the Winsor Mill, Burlington, N. C. as loom fixer, is now overseer of weaving with the Aurora Mills, same city.

—Mr. Charles J. Trippe, is overseer of spinning, spooling and warping with the Cherokee Falls Mfg. Co., Blacksburg, S. C. He was formerly with the Bamberg (S. C.) Cotton Mills.

—W. W. Owens, has accepted a position as superintendent at Harden Cotton Mills, Harden, N. C. He was formerly supt. at Elm Grove Cotton Mills, Lincolnton, N. C.

—J. J. Davis, formerly of Clifton, S. C., has taken a position as overseer of carding and spinning of night work at the Beaumont Mfg. Co's mill, Spartanburg, S. C.

—John Phillips has resigned his position with the Pacific Mills, Lawrence, Mass., where he has been employed for 30 years.

—D. J. Skidmore has resigned as night overseer of the Fort Mill Mfg. Co., and is now in charge of carding and spinning for the Dover Yarn Mills, Charlotte. N. C.

—W. P. Wingate recently of Mt. Holly, N. C. now has charge of spinning, spooling, twisting and warping at the mill of the Ida Mfg. Co., Charlotte, N. C.

—W. E. Tisdale is now superintendent at the Alpine Cotton Mills, Morgantown, N. C. He was recently overseer of carding and spinning at the Fort Mill Mfg. Co. Ft. Mill, S. C.

—W. K. Sanborn is now superintendent at the Cedar Falls Mfg. Co., Cedar Falls, N. C. He was formerly with the Clinton Cotton Mills, Clinton, S. C.

—John Cain is now superintendent of the Monroe Cotton Mills, Monroe, N. C.

—J. A. Waldrop formerly loom fixer with the Enoree Mfg. Co., Enoree, S. C., is now with the Union Cotton Mills, Union, S. C.

—C. A. Moore, who was recently with the Clifto Mfg. Co., Clifton, S. C., is now loom fixer for the Anderson Cotton Mills, Anderson, S. C.

—G. D. Barlow, who was formerly boss spinner with the McColl Mfg. Co., McColl, S. C., has again accepted that position with the same company.

—F. H. Johnson, formerly of Lewiston, Me., is now in charge of spinning for the Galveston Cotton Mills, Galveston, Texas.

—James Adamson has accepted a position as designer for the Griffin Company, of Passaic, N. J.

—William H. Noyes has taken a position in the bleaching department of the Wm. Clark Co.'s thread mill, Westerly, R. I.

Woolen.

—Elmer Eldredge has accepted a position as boss finisher at the S. A. Owen mill, of Hope Valley, R. I.

—Charles Alterbridge has accepted a position as boss dyer in Mapleville, R. I.

—J. L. Brown is boss dyer for the Hudson River Woolen Mills, Newburgh, N. Y. He was formerly at No. Dexter, Maine.

—Fred Morey, formerly of Baraboo, Wis., is now boss weaver at the Danville Woolen Mills, Danville, Ill.

—The Racine Woolen Mills, Racine, Wis., have secured the services of Chas. Naylor as boss finisher.

—James Johnston has resigned his position as second hand in the card room of the Linwood Mills, No. Adams, Mass., to accept a position at Passaic, N. J.

—John McIntosh has resigned his position as boss dyer for the Hawthorne Mills, Glenville, Conn.

—Philip M. Smith, superintendent of the Henderson (Ky.) Woolen Mills, has been promoted to the position of secretary and treasurer of the company.

—Joseph E. Jewett has accepted a position as overseer of spinning in the Collins Mills. He was formerly at South Windham, Me.

—T. T. Somerville, formerly of Worcester, is now with the Perseverance Worsted Co., at Woonsocket, R. I., as boss finisher.

—Thomas Flynn is now with the Colchis Mill, Woonsocket, R. I., as overseer of wool sorting. He was formerly at Blackstone.

—Arthur Graves has accepted a position with the Bridgeton Worsted Co. of Pascoag, R. I.

—Mr. J. Shirreff has been appointed agent of the Fitchburg, Mass. Worsted Co. by the directors, the change taking effect Sept. 1. Mr. Shirreff was at one time connected with the Globe Woolen Co. and later with the Washington Mills.

—Elmer Packard, formerly with the Riverside Mill, has taken a position with the Summit Woolen Co., Staffordville, Ct.

—Joseph Thornton has taken a position as second hand of spinning in the Rock Mill, Rockville, Ct.

—F. C. Werner of Broad Brook, Conn., has taken a position as designer at the Blackington Woolen Mill, Blackington, Mass.

—James O'Kell has resigned his position at the Oak Valley Woolen Co.'s mill, Oak Valley, R. I.

—Richard Head has resigned his position as overseer of carding for the Conshohocken Woolen Co., which position he has held for the past 37 years.

—Benjamin Barrett is now boss wool sorter for the American Worsted Co., Woonsocket, R. I.

Alizarine Black

(PATENTED)

Distinguished from all other blacks by the acid test . . .

It is an acknowledged fact that woolen goods for men's wear of American manufacture, due to the more general use of Alizarine Dyes (including the Alizarine Black), are faster in color and therefore give better service to the public than the foreign goods. This is of special importance in view of the fact that our climate with the clear skies and bright sunshine is more trying to colors than in England, Germany or France

Wm. Pickhardt & Kuttroff

NEW YORK

—Eleazer Davies, recently of Huntington, Mass., is now boss dyer for the Plymouth Woolen Co., Plymouth, Mass.

—John A. Ryan, recently of Lowell, is now superintendent for the Crosby Mfg. Co., East Glastonbury, Conn.

Knit.

—Wm. B. Leroy, formerly of the Globe Mills No. 2, Cohoes, N. Y., but who was obliged to transfer this property to George W. Kavanaugh and others, at the time of his failure, has now been engaged as superintendent of Globe Mill No. 2.

Miscellaneous.

—Thomas Farrell is now in charge of the American Worsted Co., Woonsocket, Wm. H. Smith having resigned.

—Massachusetts, New Bedford. John Sullivan, superintendent of the Acushnet Mills resigned his position at that place four weeks ago.

—Richard Drewhurst, who has been engaged in the dyeing business in Lawrence, died at his home in Haverhill August 28.

Marriages.

—The marriage has taken place of Platt Hurt and Miss Bertha Mullinax, both of the Spartan Mills, Spartan, S. C.

Deaths.

—Mr. Henry V. Meigs, a prominent textile manufacturer, died Aug. 30, in Russell County, Alabama, at the age of seventy-five years. Mr. Meigs was once an owner of the Clapp factory property and after the war was general superintendent of the Eagle & Phenix Mills. He is survived by a brother and three sisters.

—Capt. G. M. Williams, president of the Swift Cotton Mills, Columbus, Ga., died July 30. On the day of his funeral, Sept. 1, the factory was closed. He was universally loved and respected.

—John H. Barden, proprietor of the Ponagansett Mill at Rockland, R. I., died Aug. 30, at the age of eighty-one years. Mr. Barden has held positions of Justice of the Peace, Town Moderator and various other town offices. In 1889 he was elected to the House of Representatives of the General Assembly of Rhode Island from his native town, and later to the State Senate. He held various offices in different local orders.

BUYERS' INDEX

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son, Bolton, England.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Popham, H, & Son, East Newark, N. J.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Ulmer Leather Co, Norwich, Conn.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Bobbins, Spools, Shuttles, Etc.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.
Imperial Chemical Co, 432 Market St, Phila, Pa.
Lord, G. W, 316 Union St, Phila, Pa.

Boxes, Paper.
Palmer, J. S, 35 Wistar St, Germantown, Pa.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes and Braids.

Burr Pickers.
Atlas Mfg. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Business and Financial Brokers.
Riggs & Co, 575 Bourse, Philadelphia, Pa.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Farnsworth Card Clothing Co., Pittsfield, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Feeds.
Atlas Mfg. Co , Newark, N. J.
Kitson Machine Co, Lowell, Mass.
Tindell, Henry, 15 Grant Ave., Harrison, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Calico Printers' Machinery and Supplies.
New Bedford Copper Co, New Bedford, Mass.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals.
De Ronde, A, & Co, 254 Front St, New York.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Huntington, Dr. H, 159 Front St, New York.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants.
Hayes, O. H, & Co, New York.

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.
Brabender, Chas, Sr, Paterson, N. J.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton Machine Co, Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co, Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Mason Machine Works, Taunton, Mass.
Payne, Geo. W, & Co, Pawtucket, R. I
Saco Water Power Machine Shop, Biddeford, Me.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Atherton Machine Co, Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.
D'Este & Seeley Co. (Curtis), 29 Haverhill St, Boston, Mass.

Designers.
Fresnel, Gustave, 125 W. 56th St, N. Y.
Hand, F, & Co, Paterson, N. J.

Dryers.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.

Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Warren, W, Thread Works, Westfield, Mass.
Webster Job Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks.

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Anchor Color Mfg. Co, 464 Cherry St, New York.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 172 Purchase St, Boston, Mass.
Bairstow, T, & Co, 211 Pearl St, New York.
Beach & Co, Hartford, Ct.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Corey, S. J, 273 Congress St, Boston.
De Ronde, A, & Co, 254 Front St, New York.
Dillon & Co, 20 Cedar St., New York.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Harway Dyewood & Extract Mfg. Co, 184 Front St, N. Y.
Holliday, Read, & Sons, 109 William St., New York.
Innis & Co, 120 William St, New York.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J, & Co, 178 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 157 Maiden Lane, N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.

Dyers and Finishers.

Bay State Dyeing & Finishing Co, North Andover Depot, Mass.

Boston Finishing Works, Williamstown Mass.

Cranston Worsted Mills (yarns), Bristol R. I.

Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.
Webster Job Dye Works, Webster, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1906 N. Front St, Phila.

Edgings.

See Tapes, Braids and Edgings.

Electricity.

Beacon Lamp Co, New Brunswick, N. J.
General Electric Co, Schenectady, N. Y.

Electrotyping and Printing.

J. J. Ryder & Co, 210 Westminster St, Providence, R. I.
Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N.Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Engineers, Electrical.

Smeallie Bros, Amsterdam, N.Y.

Engineers, Mechanical.

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.
Smeallie Bros, Amsterdam, N. Y.

Engraving on Wood.

Ryder Co, J. J, 210 Westminster St, Providence, R. I.

Express Money Orders and Travelers' Cheques.

American Express Co, offices in every city

Fans—Exhaust and Ventilating.

See Ventilating Apparatus.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.
Smeallie Bros, Amsterdam, N. Y.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Fuel Oil Furnaces.

Rockwell, W. S, & Co, 27 Cortland St, N. Y.

Fulling Mills for Woolen Goods.

Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Singeing Machines.

Curtis & Marble Machine Co, Worcester, Ms.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.

New Jersey Car Spring & Rubber Co, Jersey City, N. J.

Index.

Burr Index Co, 336 Asylum St, Hartford, Conn.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).
Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.
Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger, Edgings, Germantown, Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, cor. Hope and Huntingdon Sts, Philadelphia.

Knit Goods Finishing Machines, Crochet, Etc.
Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Von Buchwald, W. C, 120 N. 7th St, Philadelphia, Pa.

Knit Goods Brushers.
Ardrey, S. B, & Sons, Bristol, Pa.
Jones, Lewis, Philadelphia, Pa.
Musgrove, Chas. M, Pittsfield, Mass.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Stanton & Lewis, 318 Branch St, Phila, Pa.

Knitting Machinery.
Bohm, Albert, Agt. for R. Stahl, Germany, 114 Nassau St, New York.
Boss Knitting Machine Co, 7th and Walnut Sts, Reading, Pa.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Champion Sewing Machine Co, N. W., cor. American and Diamond Sts, Phila, Pa.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Co, South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co, 1711 Randolph St, Philadelphia, Pa.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St, Phila, Pa.
Union Raveller Co, Troy, N. Y.

Knitting Needles.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co, 1711 Randolph St, Philadelphia, Pa.
Lydall, H, & Foulds, Manchester, Conn.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St Phila, Pa.

Lamps, Electric.
Beacon Lamp Co, New Brunswick, N. J.

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.
Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.
Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Schofield, Geo. L, 123 N. Front St, Phila,

Machinery Wipers.
American Silk Mfg. Co, 311 Walnut St, Philadelphia, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble, Machine Co, Worcester, Ms
Elliott & Hall, 54½ Harmon St, Worcester Mass.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Brown Bros. & Co, Providence, R. I.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Hill, Jas, Mfg. Co, Providence, R. I.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Stevenson Bros. & Co, 132 So. 2d St, Philadelphia, Pa.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Machine Co, Springfield, Vt.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Oilless Bearings.
N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Oil Filters.
Burt Mfg. Co, Akron, Ohio.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Paints.
American Fire Resisting Paint Co, 17 Broadway, New York.
Devoe & Reynolds, Fulton and Williams St, New York.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.
Dalrymple, George, Fair Haven, Vt.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.

Pipe Covering (Magnesia).
Keasby, R. A, 54 Warren St, New York.
Keasby & Mattison Co. Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
General Electric Co, Schenectady, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kilburn, Lincoln & Co, Fall River, Mass.
Smeallie Bros, Amsterdam, N. Y.

Presses.
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.
Novelty Textile Printing Co, 525 W. 24th St, New York.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Smeallie Bros, Amsterdam, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Brown Bros. & Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
John Whitaker Reed Co, 194 Front St., Worcester, Mass.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Roller Skins.
Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 960 Manton Ave. Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Saddles, Stirrups and Levers.
Dixon Lubricating Saddle Co, Bristol, R. I.

Sample Cutters.
Gleason, A. H, Rockbottom, Mass.

Schools.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.
Birch Bros., Somerville, Mass.
Champion Sewing Machine Co, N. W., cor American and Diamond Sts, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co, Salem, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.
New Bedford Copper Co, New Bedford, Ma.

Sizing.
American Glutrose Co. Penn Mutual Bldg, Phila, Pa.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.

Soaps.
American Soap & Washolene Co, Cohoes, N. Y.
Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.
Underwood, A. J, 38 South Gate St, Worcester, Mass.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 960 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinners' Supplies.
Dixon Lubricating Saddle Co, Bristol, R. I.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Damper Regulators.
D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.
Newburgh Ice Machine & Engine Co, Newburgh, N. Y.
Toomey, Frank, 131 N. 3d St, Phila, Pa.

Steam Separators.

D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Specialties.

D'Este & Seeley Co, 29 Haverhill St, Boston
Haines, W. S. C, 136 South 4th St, Phila, Pa.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Traps.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S, 132 So. 4th St, Phila, Pa.

Tanks, Tubs and Vats.

Brabender, Chas, Sr, Paterson, N. J.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Hall, Amos H. No. 2nd above Cambria, Phila, Pa.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.

Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger & Co, Germantown, Pa.
Kenyon, John J, Pawtucket, R. I.
Perseverance Mills, 2632-40 Mascher St Phila, Pa.
Weimar Bros, cor. Hope and Huntington Sts, Philadelphia.

Teasels.

Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S, 132 So. 4th St, Phila, Pa.

Tentering Machines.

See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.

Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.

American Express Company.

Turbines.

Bradway, C. P, West Stafford, Ct.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co, Keene, N. H.
Hunt, Rodney, Mch. Co, Orange, Mass.
James Leffel & Co, Springfield, Ohio

Valves.

D'Este & Seeley Co, 29 Haverhill St, boston Mass.

Ventilating Apparatus.

Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Heating & Ventilating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).

Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.

Watchman's Clock.

Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116 Chambers St, New York.

Water Pressure Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.

Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co, Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Bradway, C. P, W. Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.
Replogle Governor Works, Akron, Ohio.
Smith, J. Walter, 31 No. Foster St, Worcester, Mass.

Winders. (Hosiery.)

Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 156 N. Front St. Phila Pa.

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.

Daly, Jas. E., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Muhlhauser, F, Co, Cleveland, Ohio.
Sullivan, R. T, 155 Federal St, Boston, Mass.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Atlas Mfg. Co., Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Payne, G. W. & Co, Pawtucket, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
White, John F, 38 River St, Providence, R. I.
Woonsocket Machine & Press Co Woonsocket, R. I.

Wool, Hair and Noils.

Fowles & Co, 102 Church St, Phila.
Lyon, John H, & Co, 12 Reade St, N. Y.
Muhlhauser, F, Co, Cleveland, Ohio.
Webb, Chas. J, & Co, 156 N. Front St, Phila Pa.

Wool Shoddies.

Bowers', James, Sons, Ltd, Chester, Pa
Daly, James E, Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Muhlhauser, F, Co, Cleveland, Ohio.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.

Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.

Kitson Machine Co, Lowell, Mass.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Kenyon, John J, Pawtucket, R. I.
Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.

Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
White, James F, & Co, N. Y. and Phila, Pa.
Whittier Cotton Mills, Lowell, Mass.

Carpet Yarns.

Fleming & Chapin, 215 Church St, Phila, Pa.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Catlin & Co, New York and Boston.
Dana Warp Mill, Westbrook, Me.
Eichman & Sternberg, 488 Broadway, N. Y.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.

Cotton Warps and Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Germantown Spinning Co, Germantown Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co., 86-88 Franklin St.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Blodgett & Orswell, Pawtucket, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Kenyon, John J, Pawtucket, R. I.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Hadley Co, 95 Milk St, Boston, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C, & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Abegg & Rusch, 92 Grand St, New York.
American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Clear River Mills, Pascoag, R. I.
Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Holland & Webb, 487 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Porter Bros, 78 Worth St, New York.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Jute Yarns.

Eichman & Sternberg, 488 Broadway, N. Y.

Mohair Yarns.

Abegg & Rusch, 92 Grand St, New York.
Eichman & Sternberg, 488 Broadway, N. Y
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Holland & Webb, New York.
Malcolm Mills Co, 216 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Ramie.

Holland & Webb, New York.

Silk Noils and Yarns.

Skerry, A. T, 47 Leonard St, New York.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Clear River Mills, Pascoag, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Rockwell, Edward M, Leominster, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson St, Camden, N. J.
Eichman & Sternberg, 488 Broadway, N. Y.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Sawyer, Manning & Co., 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

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IT PAYS to consult our CATALOG when in need of Oil Extractors Steam Separators, Engine Indicators, Exhaust Heads, Feed Water Heaters, Oil Filters. It is yours for the asking.

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SITUATIONS WANTED.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

A member of the firm is in charge of this department, and gives personal attention to each case.

WOOLEN SUPERINTENDENTS.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

1305 **Superintendent and Designer** with 20 years' experience in woolen mills, on cassimeres, cheviots, worsteds and cloakings. Is now out of employment. Wants position at once.

1290 **Manufacturer from Scotland** wishes situation as superintendent; thoroughly practical in Scotch tweeds, cheviots, Saxonies, plaids, etc., from wools to finished cloth. Will start with small salary.

1255 **Felts.** The advertiser has a thorough, practical knowledge of all the details connected with the manufacture of paper makers' felts and jackets; especially adapted for fast running machines; good reason why he is now in the market; recommended by past employers.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

1239 **A man who understands the** manufacturing of woolens in all the details, is open for an offer. Is an experienced manager, and is at present in charge of a mill that is being run at a profit.

1227 **A Superintendent** with a thorough practical training in all the departments of a woolen mill making worsted cassimeres, dress goods, cloakings, overcoatings, robes, blankets, shawls, etc. Has a thorough knowledge of designing and has held position in first class mill, to which he can refer.

1231 **Manufacturer.** One who has had a thorough experience in the management of a mill of his own, and who can show proof as to his ability, is now in the market for a position as superintendent or assistant superintendent with any good company. Age 40; married.

1222 **Superintendent, Designer and** Weaver. Wants a position in woolen or worsted mill. Understands the work thoroughly, on a great variety of goods.

COTTON SUPERINTENDENTS.

1265 **Superintendent** wants position as superintendent of cotton cloth mill. Has had charge of each department in the mill; aged 28 years; married.

1266 **Cotton** superintendent wants position. Out on account of mill shutting down. Understands fancy and plain cottons, white and colored. Has a first-class record.

1267 **Cotton** superintendent or carder. Prints, sheetings, ginghams, fine and coarse, white and colored. Nearly all kinds of machinery. References all right. Age 47; married.

1269 **Cotton** superintendent, carder, spinner and dresser; 43; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

WOOLEN CARDERS.

1249 **Carder and Spinner,** woolen, wants position. Familiar with a great variety of goods. 37 and married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1307 **Carder** with unusually fine record and very wide experience desires good position in New England, Central or Western States. First-class references from past positions. Age 44. Experience on cassimeres, cheviots, dress goods, broad-cloth, repellants and blankets.

1309 **Woolen Carder.** 21 years' experience in charge at first-class mills. Has worked on fancy cassimeres, cheviots, meltons and kerseys. Age 45; married. At present out of work.

1230 **Superintendent or Carder and** spinner wants position in woolen mill. Age 30; married. Can take position at once. Familiar with jeans, cassimeres, flannels, knit goods and shoddies.

1233 **Felt** Overseer of Carding. A good man on felt or woolen goods. Aged 35; married. Can refer to past employers.

COTTON CARDERS.

1291 **Overseer of Carding and Spinning.** Would like to change from present position to something better. Familiar with Davis & Furber cards and mules, Cleveland cards, Johnson & Bassett mules. Excellent references. Has been superintendent in several mills. Could also take position as assistant superintendent of hosiery mill.

1277 Young Frenchman, with wide experience and good references, wants position as boss carder. Age 38; married.

1138 Second hand of cotton carding wants position. Has had a good experience in that position. References.

1260 **Young Man** who has worked up through carding rooms of some of the best mills in New England, wants position as overseer in New England or Middle States. Age 27. Not married.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

WOOLEN SPINNERS.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1287 **Young Man** wants position as boss spinner. Experience in first-class mills on cassimeres, kerseys, cheviots, satinets; knows Davis & Furber, Paul and Johnson & Bassett machines. Age 29. Wife works in mill.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

COTTON SPINNERS.

1284 **Eleven years as Overseer** in first-class gingham mill, with other experience, has fitted this man for good position in charge of ring spinning, spooling and warping. Age 40. French American; married.

1223 **Wants position as Overseer of** Spinning or Twisting, or both. Familiar with fine or coarse numbers. Refers to past and present employers.

1272 **Second Hand** of cotton ring spinning wants position in Massachusetts, Rhode Island, Maine or New York. Age 23; married.

1280 **Wanted, situation** as overseer or second hand of mule spinning by a thorough, practical man. Good references from past and present employers. Understands all English makes of mules. Will go South or Canada.

WOOLEN WEAVERS.

1008 **Wants boss job in flannel mill.** Northern New England preferred, also a good man for dresser or fixer, has worked on flannels, serges, cheviots, fancy dress goods. Is 34, married.

1216 **Weaving and Dressing.** Man wants position as overseer of weaving or dressing, or both, in some good woolen mill. Has had 16 years' experience. Can pick patterns and figure yarns. Has references.

1253 **Weaver, Designer or Superintendent** Open for a position. Refers to past and present employers. Aged 47; married. Worsted cloakings, cassimeres and dress goods.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1273 **Woolen** weaver wants position. Age 35; married. A first class man.

COTTON WEAVERS.

1297 **Overseer of Weaving.** A man of the very best standing desires a permanent position in first-class mill. He has worked in several of the best mills in New England for upwards of twenty years, and can show splendid references. Has worked on sheetings, prints, sateens, fancies, lenos and plaids. Now unemployed.

1242 **Overseer Cotton Weaving.** Familiar with plain cloths, sateens, fancy checks and stripes, box looms and dobbies. References. Age 43; married. One weaver, one twister in family.

1235 **Cotton** man wants position as overseer of cotton weaving. Prints, twills, satins, denims, cheviots, lenoes, etc. Crompton, Knowles, Lowell, Whiting and English looms.

1288 **Overseer of Cotton or Worsted** weaving wants position. Familiar with all kinds of looms; plain or fancy work. Age 45; married.

1281 **Overseer of Weaving.** Englishman; age 36; married. At present employed in good mill. Would like a position paying more than $3.00. Experience on fine ginghams, plain and fancy cotton and worsted dress goods.

1261 **Weaver.** Cotton, woolen, ramie and silk goods. Good experience in first-class mills.

176 **Wanted** a situation as cotton weaver or as superintendent; am a strictly temperate man; married; 40 years old; am a practical man and a pusher. Will go anywhere, and at any price to suit the times. Will guarantee satisfaction in every respect. Now employed. Correspondence invited. Can furnish good references if required.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

FINISHERS.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

228 **Worsted or Woolen Finisher.** One of the best men in the country. Age 36; married. English. Has had charge of the leading mills in this country. His experience covers woolen and worsted men's wear, also ladies' dress goods, overcoatings, cloaking, etc. Understands the new German finish applicable for dress goods up to eight ounces. By stiffening on the back this finish makes single warp filling goods equal to two-ply.

1285 **Young Man with Experience** on almost all lines of woolens and worsteds. He never held boss job, but feels able to fill such a position. Age 25; not married. First-class references. Would take second-hand position or as boss fuller or boss shearer.

DYERS.

1302 **Young Dyer** wants position as second-hand or overseer in small mill. Has been under good men in well-known mills.

1303 **Dyer** with six years' training in Bradford, England, but coming to this country. Has been in several American and Canadian mills and given best satisfaction. A thoroughly practical and up-to-date dyer. Age 32. At present employed, and would accept only first-class position.

1304 **Wool Dyer.** 16 years' experience, largely in New England mills, and now employed in the South, desires a position in New England mill. American; married. Thorough knowledge of raw wool and shoddy dyeing in acids, fast alizarine colors; also raw cotton in blacks, browns and blues.

1298 **Wool Dyer.** Young man with experience in New England mills on piece dyes, wool, shoddy and rags. Is now out of a position, and will accept a position anywhere except in the South and Canada.

1292 **Woolen Dyer** with experience also in mixes, piece dyes, rags, hosiery, black cotton, waste and shoddy. Has held boss job several years. Age 34; married. Very good references.

Woolen Dyer with experience on fancy cassimeres, cheviots, meltons; strictly temperate; fair pay; references. Age 26; single. Address "Special" care TEXTILE WORLD.

KNITTERS.

1257 Superintendent of knitting mill wants position; is a finisher and understands every part of the business, including shipping all kinds of goods, fabrics, cotton, worsteds, silks, wool on all kinds of shapes, and flat goods; most all kinds of knitting machinery and finishing machinery; age 32; married; refers to past record.

1274 A man who thoroughly understands the manufacture of hosiery from the fleece to the case, and is a good manager. Desires to correspond with parties wishing to employ such a man.

1310 **Foreman** with large experience in circular rib knitting. Has worked on almost all kinds of machinery. Is at present out of work, because of mill going out of business. Age 25. Excellent references.

DESIGNERS.

1275 **Designer** or assistant. Age 25; married. A good man on cotton or worsted fancy dress goods. Jacquard and box looms.

1263 **Assistant** Designer or Assistant Superintendent. Has received a practical mill experience, and is a graduate of the Philadelphia Textile School. Unions, cassimeres, suiting, cloakings. Age 24 years.

1259 **Color Designer** or Woolen Superintendent. Age 39. Good, steady reliable man. Refers to past employers.

1252 **Designer, Weaver or Dresser.** Aged 40 years; married. Familiar with nearly all kinds of men's wear, piece dyes, etc. Refers to past and present employers.

MISCELLANEOUS.

1300 **Wool Sorter** with experience in first-class English mill. Thorough knowledge of wool, noils, waste and all kinds of garnetting. Has not been employed in this country, but can give American references as to character.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1283 **Laboratory Chemist** with experience in large mills and supply house desires position. A moderate salary.

1293 **Bookkeeper** with 22 years' experience in woolen and worsted mills; excellent references. Age 50. Wants permanent position with moderate salary.

1282 Foreman Roller Covering and Belts seven years, and four years foreman in large mills. Excellent references. A reliable young man.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

1229 **Dresser.** Overseer of woolen dressing. Age 30. Men's wear and dress goods. Good references.

1228 **Shearer.** Wants position as overseer of shearing. Good man on cassimeres, worsteds, unions and cheviots. Age 25; married. References.

1162 **Good Man for Beaming Department.** On heavy sized, plain calicoes and colored cotton goods, twills and sheetings. Will go anywhere. Age 33; married. Good references.

Superintendent of Hosiery Mill. 18 years' experience. Capable of taking entire control of every department in a large mill; just the man for new plant; will go anywhere; South preferred. Age 38. Address B. L. care TEXTILE WORLD.

WOOLEN YARNS.

Single, also Double and Twist
For Weaving Hosiery.

COVERT CLOTH YARNS A SPECIALTY.

Raw Stock and Piece Dyeing.

CLEAR RIVER MILLS,

PASCOAG, R. I.

FOR SALE.

New and Second-hand Noble Combs, Gill Boxes, Drawing, Spinning and Twisting Machines. Also 72 in., 85 in., 115 in., Knowles Looms, fitted up for Jacquard work, Cop Winders, Chenille Reels, Chenille Cutters and Tassell Making Machines. All kind of Change Wheels for worsted mills, Belting and Mill Supplies kept in stock. Apply to

EDWARD JEFFERSON & BRO.,

28 Strawberry Street, Philadelphia, Pa.

SOLE AGENTS FOR

J. B. Farrar & Sons, Halifax, England,

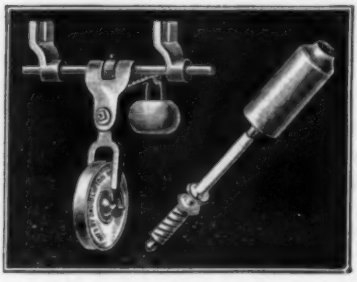
Mfrs. Spinning, Drawing, and Twisting Machinery.

Oil Filters...

We are the largest manufacturers. Our "Cross" Filter has been on the market 7 successful years. Used in 12 countries. Specially adapted to Cotton and Woolen Mills. Capacities 3 to 120 gals. per day. Sent on approval. Reduces oil bills 50%. Interesting reading matter upon request.

The BURT MANUFACTURING CO.
Akron, Ohio, U. S. A.

WANTED, second-hand KNOWLES & CROMPTON Fancy Looms 100 or 108 inch reed space, 24 harness, 4 x 4 box, improved motion, in good condition. Address No. P 154, this office.



Mill Supplies.

OUR SPECIALTIES:

Spinning Tubes,
Caps (Steel or Iron),
Spindles,
Tension Pulleys, Etc.

Quality and workmanship guaranteed

WM. S. SPOFFORD & SON,

5-11 Culver St., Providence, R. I.

Makers of the Bamford & Smith Self-lubricating Spinning Tube.

H. POPHAM & SON,

MANUFACTURERS OF

The Best Round Belting

FLAT BELTING, RAW HIDE BELL CORD, and Importers of

ENGLISH PICKER LEATHER.

East Newark - - - - New Jersey.

Endorsed by Board of Fire Underwriters.

SUPERIOR TO

COTTON WASTE.

Safe, Durable and Cheaper.

RAW SILK MACHINERY WIPERS.

AMERICAN SILK MFG. CO.,
311 Walnut St., PHILA., PA.

Endorsed at the recent meeting of N. E. Cotton Mfrs.

STEVENSON BRO. & CO.,

OILS,

MILL AND FACTORY SUPPLIES, WAX, Etc.

132 South Second St., **PHILADELPHIA.**

Cable Address, "CLIMAX." Telephone 2869.

—From Italy some knowledge of dyeing spread gradually to France, Spain, and Flanders, and it was from the latter country, where considerable perfection in the art had been attained, that Edward III. procured dyers and, in 1472, a Dyers' Company was incorporated in London.

FOR SALE.

The well-known Buena Vista Cassimere Mills, situated in the city of Buena Vista, Rockbridge Co., Virginia, on the lines of the Norfolk & Western and C. & O. RR. Wool and labor cheap. The plant is in perfect running order, and consists of two full and complete sets of machinery of the best American and English makes, for the manufacture of fine and medium cloths, cassimeres, beavers, and fine steam finished face goods. For full particulars address

R. W. WINBORNE.
Buena Vista, Va.

Cloth Washers, Fulling Mills, Piece Dyeing Machines, etc.

You want the best, We build them.

A. HOPKINS & CO.,

BRIDGETON, - - R. I.

—We get our English word "fuller" from the Latin "fullo," a cleanser of cloth, and this is undoubtedly the origin of "fulling."

RIGGS & COMPANY,

(ESTABLISHED IN 1872.)

Business and Financial Brokers.

573-575-577 Bourse, Philadelphia, Pa.

Sell all kinds of legitimate business, negotiate partnerships, procure special capital, sell stocks and bonds of first-class manufacturing and mineral corporations, and act as trustees and transfer agents. Business transacted in all parts of the Union and Canada.

Those writing us for our terms will kindly state amount involved, as they are governed thereby according to a uniform list of rates.

FOR SALE

On easy terms. Five story brick mill, two hours from N. Y. City, in New York state. Communication by three lines of railroad. Track laid to door of mill. 70,000 square feet of floor space. Coal very cheap. Help abundant at low rates. Lot 175 feet front, 139 feet deep; Building 75 feet front, 137 feet deep; Annex 42 feet front; light on all sides. Address, J. B. J., Textile World Office, Boston.

Hosiery Mill For Sale or To Let!

A new plant, capacity 100 dozen per day.

Water Power To Let, 400 H. P., with excellent buildings.

W. E. DANA, Westbrook, Maine.

FOR SALE, SECOND-HAND MACHINERY.

Double Corliss Engine, cylinder 23x60 in. Single Corliss Engine, cylinder 20x48 in. Singles Corliss Engine, cylinder 16x36 in. Single Corliss Engine, cylinder 12x24 in. 30-40 50-80 and 100 H. P. Automatic Engines.

Large stock of Plain Slide Valve Engines, Boilers, Steam Pumps, Feed Water Heaters, Lathes, Planers, Shapers, Drill Presses, Milling Machines, Electric Motors and Dynamos, and Wood-working Machines. Let me know your wants as my stock is constantly changing. Yours respectfully, FRANK TOOMEY, 131 No. 3rd St., Philadelphia.

WANTED, A LINE

to sell to the large department stores of New England, also a line of something to sell the smaller retail stores. I have a fine acquaintance and large trade in this section, and believe I can sell almost anything that is suitable to this trade. Address, "M," care Textile World, Boston, Mass.

To Keep in Touch

With the textile manufacturing interests of the South the **MANUFACTURERS' RECORD** is indispensable.

It is recognized as the best authority on all industrial matters, relating to this territory, and maintains a Textile Department, giving in detail the development of this industry — the establishment of new mills, the advantages possessed by the South for cotton manufacturing, and notes of general interest to people in this line.

Subscription Price $4.00 per yr.

As an advertising medium it is the best that can be employed for reaching the mills of the South.

Sample copy will be sent free, and we shall be pleased to give advertising rates on application.

MANUFACTURERS' RECORD,

BALTIMORE, MD.

Frank A. Stevens, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

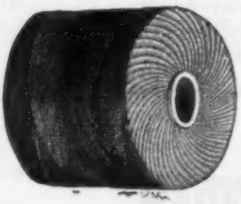
NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

UNIVERSAL WINDING COMPANY.

YARN MANUFACTURERS will advance their interests



By investigating OUR PROCESS OF WINDING.

HIGHEST AWARD at the World's Fair, Chicago, for new system of winding and also on special machines.

GOLD MEDAL awarded at the Mechanics' Fair Boston, 1895.

In their report the judges say:—"This machine develops an entirely new system of winding, by which threads and twines are prepared in the most compact compass for the market, also shows greater advance in the transfer process than has heretofore been accomplished. This new method of winding subjects the thread to no severe strain, and leaves it in the best condition for use." They also say that they consider the Universal is the greatest single advance shown in any department of our group being *a completed development of a new system*, and thus entitled to the highest award.

F. H. BISHOP, · Manager,

226 Devonshire Street, Boston, Mass.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn. Spinners still continue to get orders for heavy weight yarn, and not withstanding the fact that the tendency of raw cotton is lower, spinners continue to advance prices and are very independent regarding it. Knitters have secured orders for large quantities of cheap, heavy-weight shirts, using 1/7s white cop yarn; but the deliveries are demanded immediately, and knitters are working cautiously, as they do not wish to carry heavy-weight yarn over. Orders are being booked for light weight yarns, and many of the mills making light weights are getting all the orders they can secure. Many mills placed Egyptian yarn orders early, and will be much benefited thereby, as spinners will not take further orders ahead, as they believe that later prices will be much higher. The demand is mostly in 1/20s, 1/22s cops, and 2/42s and 2/50s lisle. Many orders are being placed, both by the Balbriggan manufacturers and also by hosiery manufacturers. Colored cotton yarn is being sold in good quantities to the knitters of fleece lined underwear.

Woolen Yarn. Spinners are getting very few orders at this time. The light-weight season for cloth is now over, and, in consequence, yarn for this work is unnecessary. The knitters have also placed their orders for the season, and the only mills requiring woolen yarn, and purchasing, are the dress-goods mills. None of the woolen yarn mill spinners have much wool on hand, and when inquiries and orders are placed they must be placed on the prices which prevail at the time the order is placed. The knitters requiring wool spun on commission are not pushing their mills, because of the sharp advance in wool. We have heard of an instance where a mill received an inquiry for certain fabric, and looked up and tested the wool, and finally took the order, only to find that wool in question had advanced largely, and the mill got stuck. We have also heard of one very large worsted spinning mill getting "stuck" in this same way, on 1,000,000 pounds, 5 cents per pound. The indications now are that the next Australian wool sales will see America buying in that market, to arrive. Already several very large credits have been taken out for this purpose.

Worsted Yarn. Spinners are all busy for immediate delivery and refuse orders for future delivery, except at the full advance. Many of the spinners who have been holding out of the market are now out for orders at the full advance, and are getting it. Many of the mills which have been idle are being put in commission again. It is rumored that the Blackstone property, which has been idle for three or four years, has been purchased by a large Providence manufacturer, and the Glenmore Mill is also going to be started up under new management. Australian 2/40s has already reached the $1.00 mark, and the going price is 95 cents for those anxious to get orders. This yarn will sell as high as $1.05 to $1.10 per pound before the first of the year, and 2/50s will sell for from $1.10 to $1.15 per pound. But any advance above these figures will be checked by importation of foreign yarn. Spinners will soon find, although they have high duties of worsted yarn, that their market will be much curtailed by the larger weavers establishing worsted spinning plants, and buying tops and not yarn. We hear of rumors to this effect, which are founded on fact, and of several inquiries and estimates for spinning machinery, with a view to immediate purchase. The weavers will adopt the system in vogue in Europe, which is to

(Continued on page 131.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

GEORGE SHIMER & SON,

Spinners of Worsted Yarn for the Weaving and Knitting Trade.

All kinds of Fancy Yarns for the Knitting Trade.

5th and Erie Sts., Camden, N. J.

AMERICAN SPINNERS'

Cotton Yarn Exchange.

COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

ARNOLD B. SANFORD, - MFRS. AGENT,

226 Devonshire Street.

BOSTON - - - - MASS.

Glazed, Bleached and Dyed

YARNS

Cone Winding.

W. WARREN THREAD WORKS.

WRITE US WHAT YOU USE, WE WILL DO THE REST.

WESTFIELD, - MASS.

YARNS

SOLIS - - BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.

(Continued from page 129.)

buy tops and do the drawing and spinning at their own mills Weavers have all the cloth they can handle, and the price of cloth is being placed higher each day. Commission men and jobbers are bluffing about importing, but, until the price of coatings is very much higher than at present, there will be no importations. Many of the weavers bought largely of yarn for light weights at fairly low prices, but the heavy weight season finds these mills short of yarn on an advancing market. Spinners are asking prices which they can secure readily. As soon as the supply of wool gives way, the advance must be paid, as there is very little fine combing wool grown in this country,—as many of the fine sheep under the new tariff were either killed off or crossed with a coarser breed, so as to meet the popular demand for cheviot wool, and get more wool per sheep. Dress goods manufacturers are very busy, and are buying yarn largely. The hosiery trade

(Continued on page 133.)

B. F. BOYER & CO.,
Successors to GEORGE SHIMER & BOYER,
HOSIERY YARNS,
In Wool, Merino and Worsted.
GOLF YARNS,
In Wool and Worsted. Also carry a full line
BUNDLE YARNS
For the Jobbing Trade.
516 Market St., Philadelphia.
MILLS, CAMDEN, N. J.

PORTER BROTHERS & COMPANY
Commission Merchants,
Trimmings, Buttons and Knit Underwear.
Sole Agents for
John Paton, Son & Co.,
OF ALLOA, SCOTLAND.
Specialties:
SCOTCH MIXTURES
For Sweaters, Golf and Bicycle Hose, Mitts, Gloves, etc.
78 & 80 Worth St., New York.
72-82 Lincoln St., Boston.

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

SAWYER, MANNING & CO.,
YARNS,
86 & 88 Franklin St., NEW YORK.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
51 & 53 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. Jenckes Manufacturing Co.
COLORED COTTON YARNS.
Cops and Cones.
PAWTUCKET, R. I.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

SILK LUSTRE COTTON YARNS

In single and two or more plys. This yarn retains its lustre through all usages and is increased in strength twenty to forty per cent.

High Grade **COTTON WARPS** and **NOVELTY YARNS.**

Printers of Cotton, Wool and Worsted Yarns.

The J. R. MONTGOMERY CO.,

. . . . . WINDSOR LOCKS, CONN.

Cotton Yarns AND WARPS Of Every Description.

James F. White & Co.
COMMISSION MERCHANTS,
54 an 56 Worth St., NEW YORK.
228 Chestnut St., PHILADELPHIA.

BURLAPS all WIDTHS and WEIGHTS.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s

PLAIN AND FANCY PATTERN

Cotton Warps,

WHITE, MIXED AND COLORED.

For SATINETS, BLANKETS, ETC.

WHITTIER COTTON MILLS,
LOWELL, MASS.

Continued from page 131.

has many orders for yarn already placed, and are getting orders extensively for hosiery, with an advance of 10 per cent. They realize that next season they must pay $1.05 per pound for what they have been paying 68 cents. The astrachan business, requiring lustrous yarn, is over for the present, but the prospects are very encouraging for a large business in the spring.

Philadelphia Yarn Market.

There has been but little change in the yarn market in Philadelphia for the past two or three weeks. Manufacturers have been expecting yarn to go down, as the new crop came in sight, but the extraordinary demand has held prices very firm, and some counts have been so very scarce, that they have advanced in price.

We quote:

WARPS.

20/1	14½ cts.
22/1	15 cts.

(Continued on page 135.)

O. H. Hayes & Co.,

WOOLENS ... NEW YORK.

OUT FOR BUSINESS. WANT THE PRODUCTION OF GOOD MILLS.

Woolen Yarns

Single, also Double and Twist for Weaving Hosiery. Covert Cloth Yarns a specialty.

Raw Stock and Piece Dyeing.

CLEAR RIVER MILLS, PASCOAG, R. I.

Cohannet Mills,

TAUNTON, MASS.

Spinners of High Grade

HOSIERY YARNS OF EVERY DESCRIPTION.

Selling Agents JAMES E. MITCHELL & Co., Philadelphia and Boston.

JOHN J. KENYON,

Pawtucket, R. I.

Manufacturer of

Silk Finished, Plain and Fancy

SPOOL - TAPES - AND - BRAIDS

for Manufacturers' use. Also Boot, Shoe and Corset Lacings, Stay Bindings, Glazed Yarns and Spool Cotton. Also agent for Pawtucket Tape Company, manufacturers of Superfine Tape.

KERR THREAD CO.

—SPINNERS OF—

Fine Combed Sea Island COP SINGLES

All Numbers, 30s to 150s.

Fall River, Mass.

WOOLEN AND MERINO YARNS.

Special line for Bicycle and Golf Goods in all shades

For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.

The J. & H. Clasgens Co.

New Richmond, O.

WOOLEN YARNS.

All grades Woolen, Mixed and Merino yarns.

15 SETS CARDS.

EDWARD M. ROCKWELL,

LEOMINSTER. - MASS.

A. HERBST. J. W. JONES.

HERBST & JONES,

Successors to Kershaw Worsted Co.

WORSTED YARN SPINNERS,

21st & Naudain Streets,

PHILADELPHIA.

C. MOORE & CO.,

MANUFACTURERS OF

TWINES, THREADS AND YARNS.

Jacquard Harness Twines of all kinds on hand and made to order.

S.W. COR. FIFTH & MARKET STS.,

Philadelphia.

EICHMANN & STERNBERC

488-492 Broadway, NEW YORK.

COTTON WOOL SILK YARNS For Weaving Knitting or Embroidering.

HARNESS TWINES.

YARNS All Numbers and Qualities.

HOLLAND & WEBB,

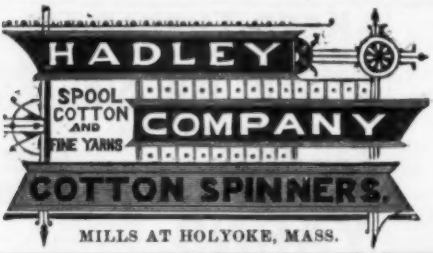
478 Broadway, New York.

NEW ENGLAND THREAD CO.

PAWTUCKET, R. I.

Manufacturers of Spool Cotton & Supefine Tapes

Thread and Yarn on Tubes and Cones for the Hosiery trade etc. Thread dressing a specialty, for weaving purposes. Dyers and Bleachers of Threads, Yarns and Tapes.



SPINNERS OF

FINE COTTON YARNS

30s TO 100s.

Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.

Fine Cotton Warps, single and two-ply, in chain, etc.

Spool Cotton and Seaming Thread.

95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,

WESTERLY, R. I.

Mills equipped with the latest and most improved machinery.

Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.

Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.

Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. PAWTUCKET, R.I.

WEAVING and HOSIERY YARNS.

We Buy for Cash

WARPS, COPS, TWIST and SOFT SKEINS, Single, Double, 3-ply, 4-ply, etc.

COLORED YARNS for HOSIERY

on Cones, a Specialty.

Correspondence Solicited.

EDWARD S. HYDE, 223 and 225 Chestnut Street, PHILADELPHIA PA.

COTTON WARPS

White or Colored.

Toweling and Grain Bags.

Dana Warp Mill,

WESTBROOK, MAINE.

Walcott & Campbell Spinning Co,

IROQUOIS MILLS.

FANCY HOSIERY YARNS

IN ALL COLORS.

New York Mills, Oneida Co., N. Y.

BOTANY WORSTED MILLS,

PASSAIC, N. J.

Fine Worsted Yarns,

— AND —

Fine Woolen Yarns

— IN THE —

GREY, COLORS and MIXTURES.

A copy of the Textile World's Directory is presented to every paid-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 133.)

26/1	16 cts.
12/2	14½ to 15 cts.
14/2	15 to 15½ cts.
16/2	15½ to 16 cts.
14/1	14 cts.
16/1	14 to 14½ cts.
20/2	16½ to 17 cts.
30/2 Eastern	19½ to 20 cts.
30/2 Southern	19 to 19½ cts.
40/2 Eastern	24 cts.

SKEIN.

26/1	15 to 15½ cts
20/1	14 to 14½ cts.
19s	14 to 14½ cts.
4s to 10s soft	13 cts.
10s to 12s hard	13 cts.
12s soft	13½ to 14 cts.
20/2	16½ cts.
14/2	14 to 14½ cts.
30/2	18 to 18½ cts.
26/2	17 to 17½ cts.

(Continued on page 137.)

THE SECRET of our popularity is no secret to our customers. Experience has taught them that we give them better work and better service than they can get elsewhere.

T. BROPHY'S SONS,
Dyers of all kinds of Yarn and Cotton Warps,
Jasper Street, above Clearfield Street,
PHILADELPHIA.

Webster Job Dye Works.

Dyeing Silk, Worsted, Cotton and Wool in Skeins, Raw Stock, Tops, Slubbing, Rags and Piece Goods. Specialties in Alizarine and Indigo Colors and Fast Black on Cotton. All work warranted.

Charles F. Robinson, Manager.
Webster, Mass.

FAST FANCY COLORS.

We make a specialty of dyeing **Mode** and **Tan** shade on hosiery and yarns, as also all other fancy shades. **Colors absolutely fast.** For particulars address

OAKDALE DYE WORKS,
913 W. York St., Philadelphia, Pa.

CARBONIZER removes burrs perfectly and leaves **Wool** white and soft
Also Bi-Sulphite of Soda, Alum and Acid.
Manufactured by the
MERRIMAC CHEMICAL CO.,
13 Pearl Street, Boston.
Works at So. Wilmington, Mass., B. & M. RR, Southern Division.

RICHARD T. SULLIVAN,
WOOL EXTRACTS,
And Fine All Wool Shoddies.
NEWTON LOWER FALLS, Mass.
And 180 Summer Street, Boston, Mass.

M. B. SCHWAB, Pres. D. W. SCHWAB, Sec.
H. RAWITSER, Treas. ED. GLUECK, Gen. Mgr.

Riverdale Woolen Co.,
MANUFACTURERS OF
SHODDIES
OF EVERY DESCRIPTION.
Capacity 7,000,000 pounds per annum.
Custom Carbonizing and Garnetting a Specialty.
RIVERDALE, NORTHBRIDGE, - MASS.
New York Office: 140 Duane Street.

ESTABLISHED 1869.
JAMES BOWER'S SONS, Ltd.
Manufacturers of
ALL GRADES AND COLORS OF
Wool Shoddies and Worsted Waste,
CHESTER, PA.
Capacity One Million pounds per year.

CHAS. J. WEBB & CO.,
Foreign and Domestic
WOOL, HAIR and NOILS
142, 144 & 152 to 156 N. Front St.,
PHILADELPHIA PA.

JAMES E. DALY
Manufacturer of
WOOL EXTRACTS and SHODDIES,
P. O. Box 395,
Paterson, N. J.
Fancy Colors a Specialty. Long Distance Telephone.

FOWLES & CO.,
Importers and Dealers
WOOLS, NOILS, HAIR,
Shoddies, Waste, Flocks, Etc.
106 Church St., Philadelphia.

John H. Lyon & Co.,
IMPORTERS AND DEALERS IN
Woolen Rags, Waste, Wool and Hair.
All Grades of Paper Stock Bought.
10 & 12 READE ST., NEW YORK.

THE GARFIELD WOOLEN CO.
MANUFACTURERS
Fine Wool Shoddies and Extracts,
in all grades and colors.
Carding, Picking, Carbonizing and Garnetting done for the trade.
GARFIELD, N. J.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

The Competition of Foreign Goods

On staple and plain fabrics under present tariff conditions makes it almost impossible to make any money, and the only hope of profit in making Dress Goods, Cloakings and Cassimeres seems to be in using

MOHAIR OR NOVELTY YARNS.

In the United States we are the only manufacturers from raw materials to finished product who make such yarns ONLY.
Perhaps we can be of use to you.

CRANSTON WORSTED MILLS, Bristol, R. I

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

(Continued from page 135.)

40/2	23 to 24 cts.
8/3 carpet	13 to 13½ cts.
10s double reeled	13½ to 14 cts.
16/3 slack	14½ cts.
16/4 medium	14½ cts.
16/2 slack	15 cts.

SOUTHERN CONES.

6s to 8s	13½ to 14 cts.
10s	14 to 14½ cts.
12s	14½ to 15 cts.
14s	15 to 15½ cts.
16s	16 to 16½ cts.
20s	16 to 17 cts.
24s	17 to 18 cts.
26s	17 to 18 cts.

SHUTTLE COPS.

6s to 8s	13½ to 14 cts.
10s	14 cts.
12s	14 cts.
16s	14½ cts.
26s	15 cts.
40s Eastern	19 to 20 cts.

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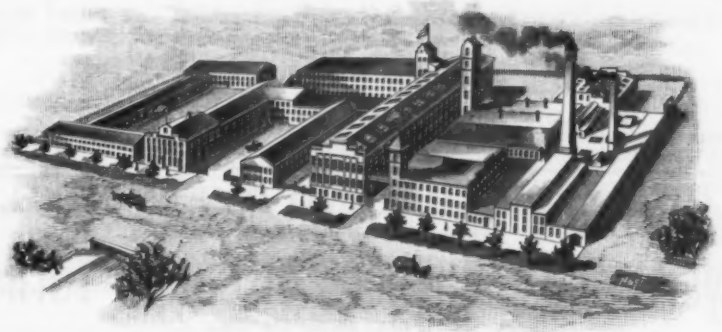

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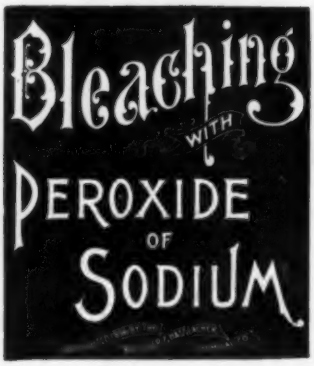

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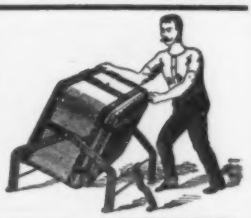

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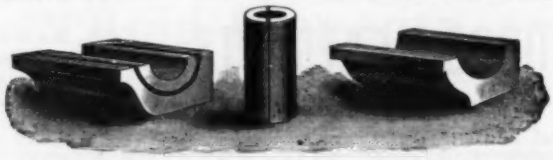

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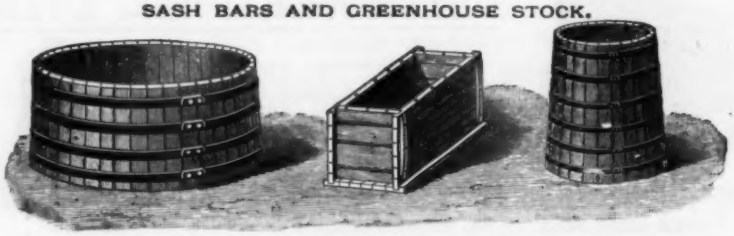

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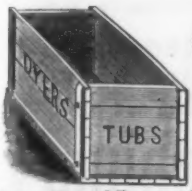

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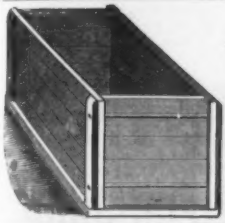

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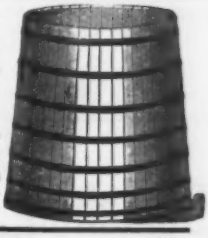

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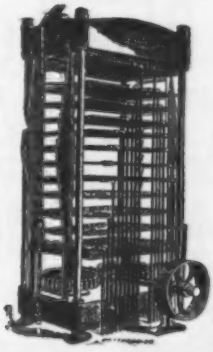

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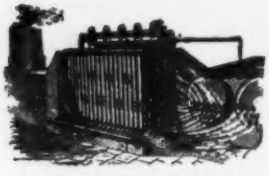

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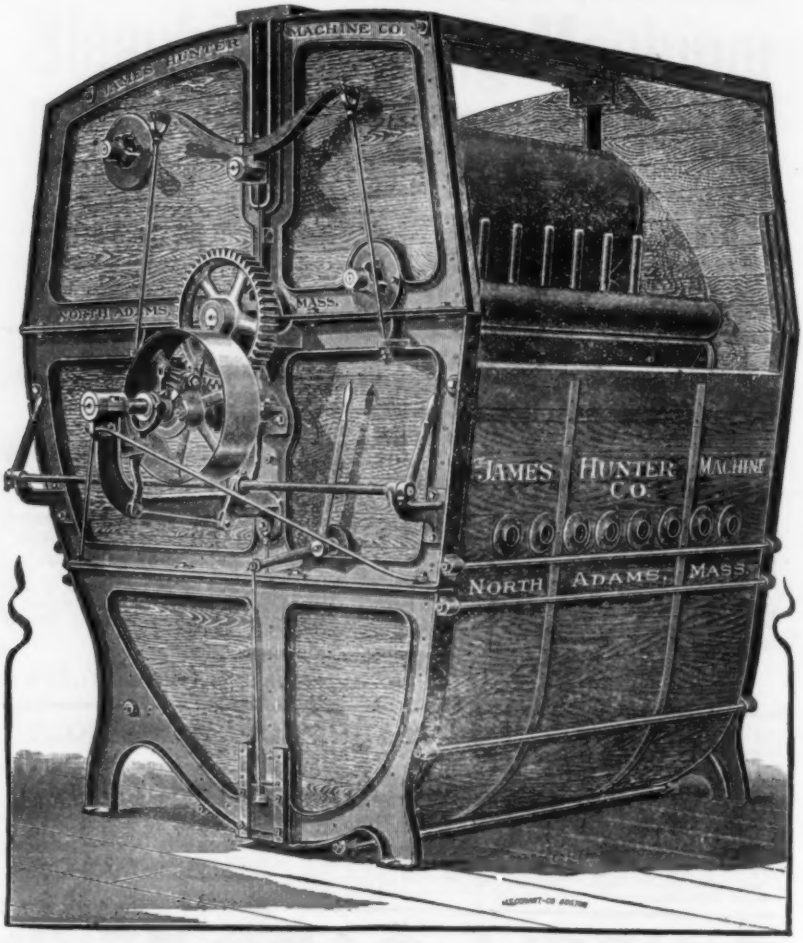

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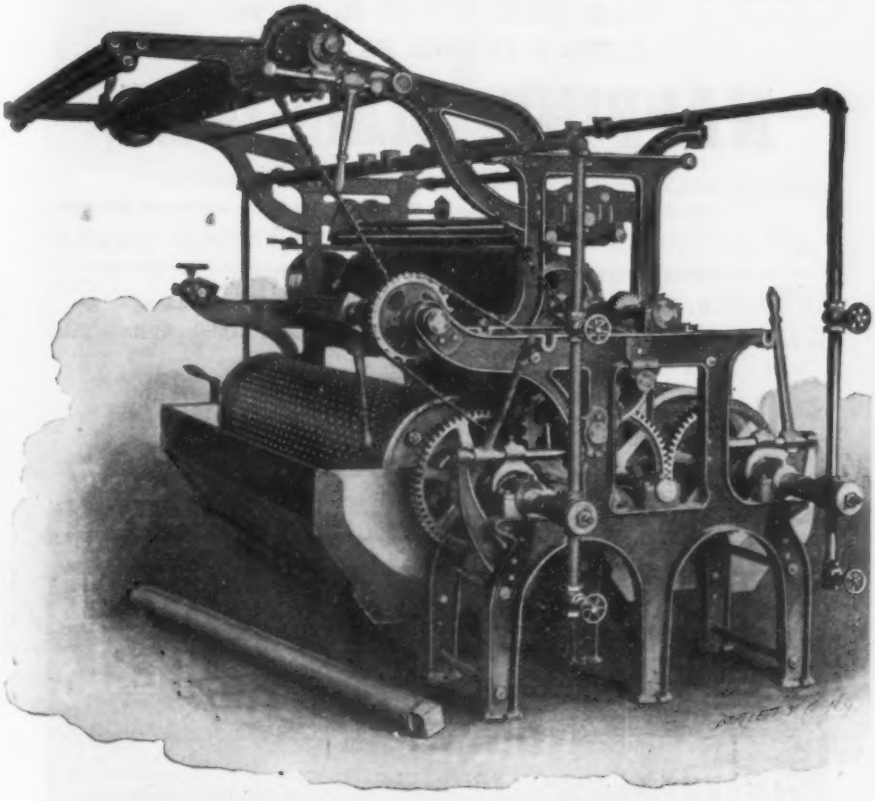

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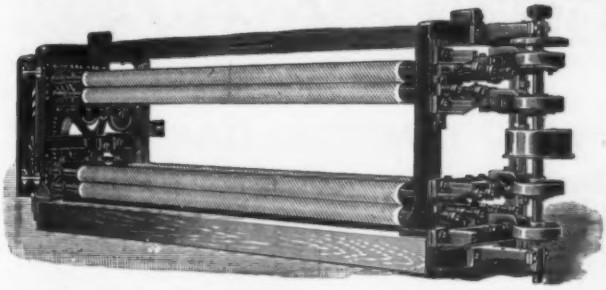

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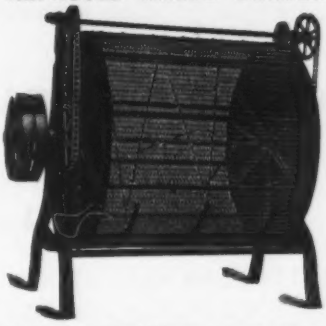

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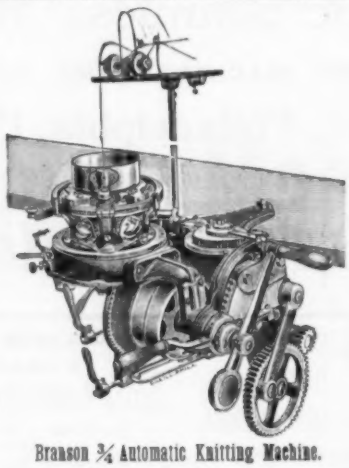

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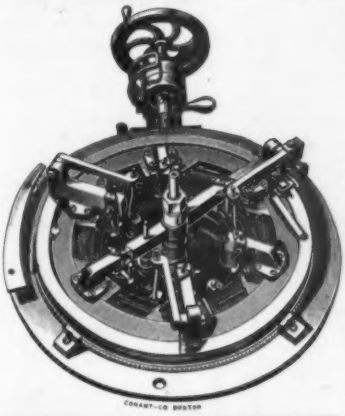

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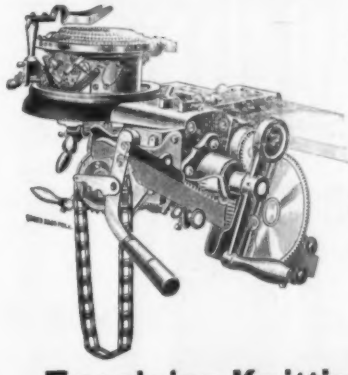

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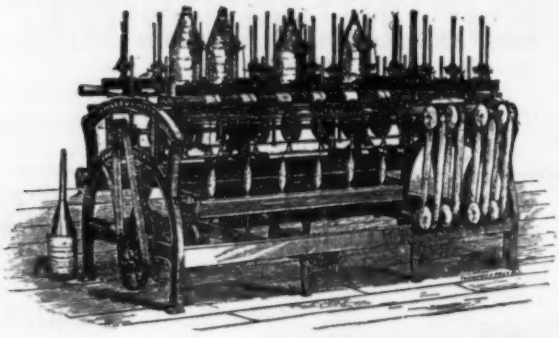

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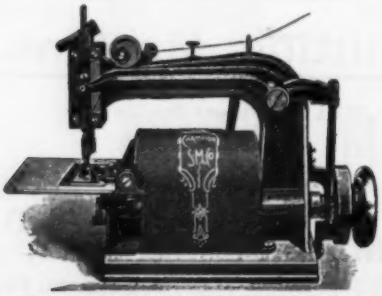

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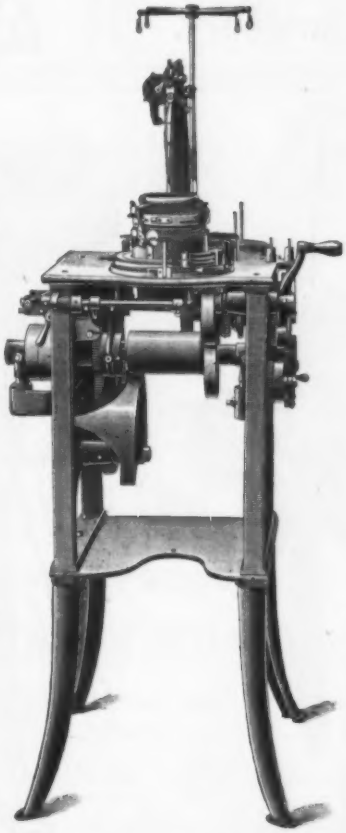

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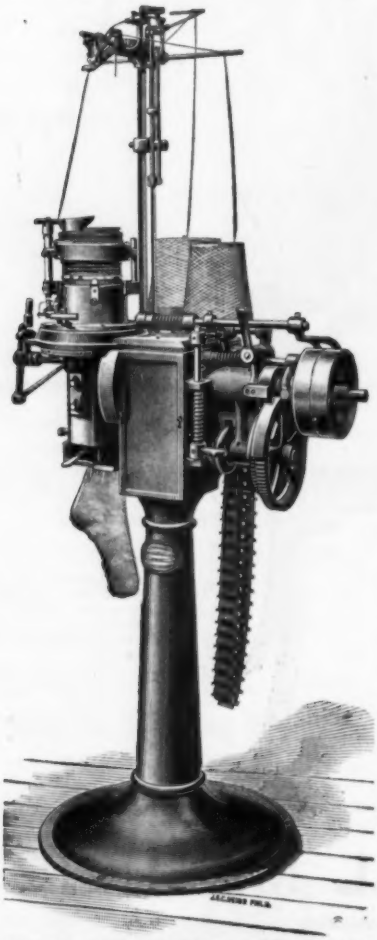

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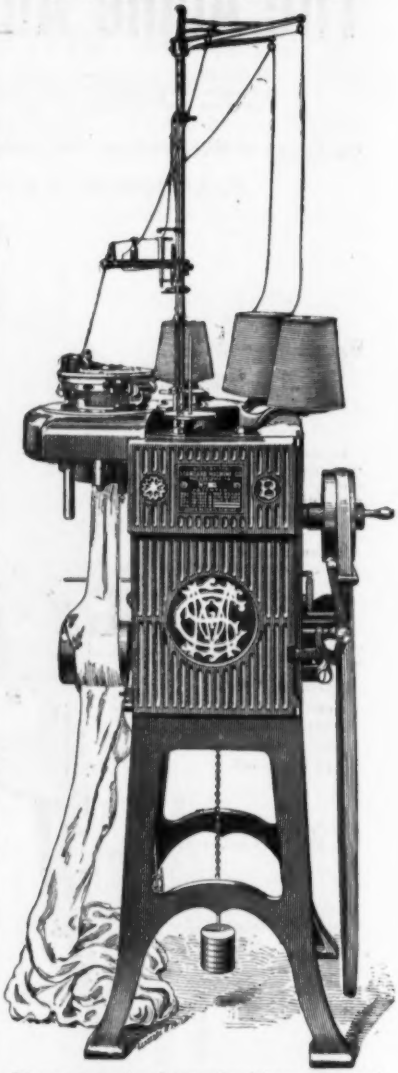

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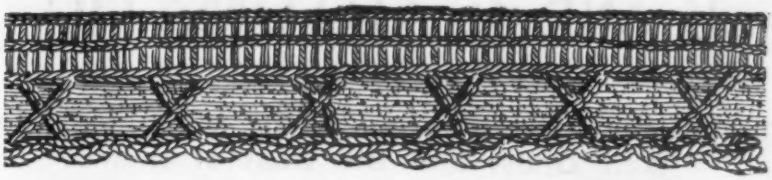

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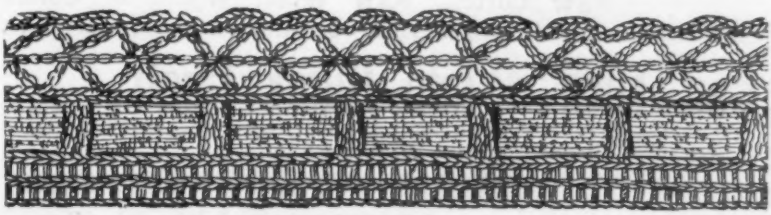

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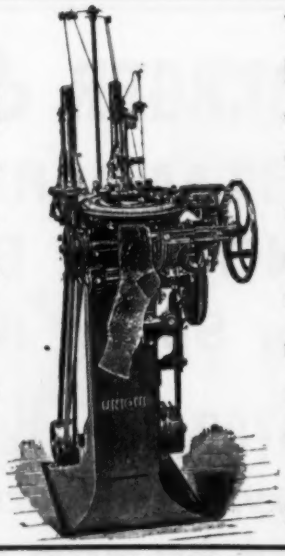

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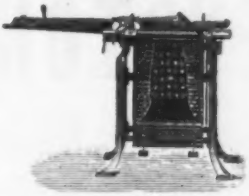

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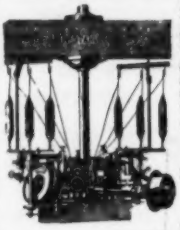

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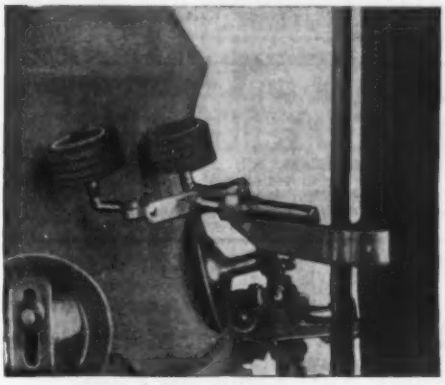

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ATTENTION IS CALLED TO THE FOLLOWING DECISION.

U. S. Circuit Court of Appeals.
Second Circuit.

Adelbert L. Traver, Appellee,
vs.
Eugene H. Brown, Appellant.

"WALLACE, CIRCUIT JUDGE." "We are unable to doubt that the machines of the appellant do not infringe the claims in controversy.

"Accordingly the decree of the Circuit Court should be reversed, with costs against the appellee, (Traver) and the cause remanded to the Circuit Court, with instructions to dismiss the bill, with costs of that court." 70 Fed. Rep. 810.

Production Points: — Increased 8 dozen per day on each Looper; fewer parts and all interchangeable; runs longer without attention, and better built. It is for your interest to try your figures on the increased production for one year's time, and see what manufacturers are saving by the use of this machine. TRIAL GIVEN FREE OF CHARGE.

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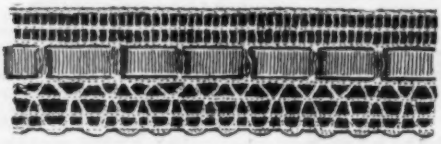
Lace  Edgings

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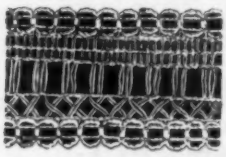

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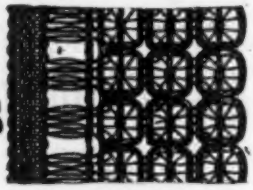

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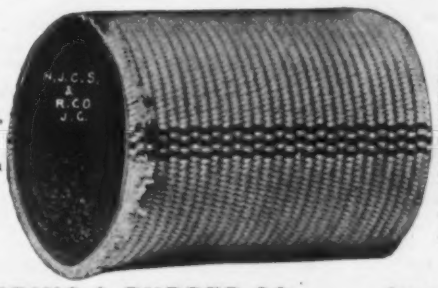

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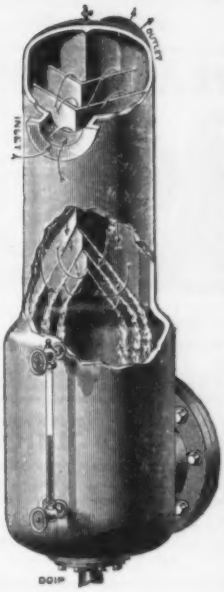

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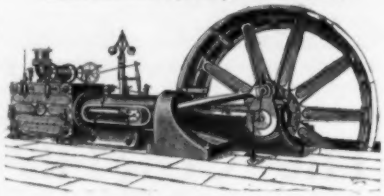

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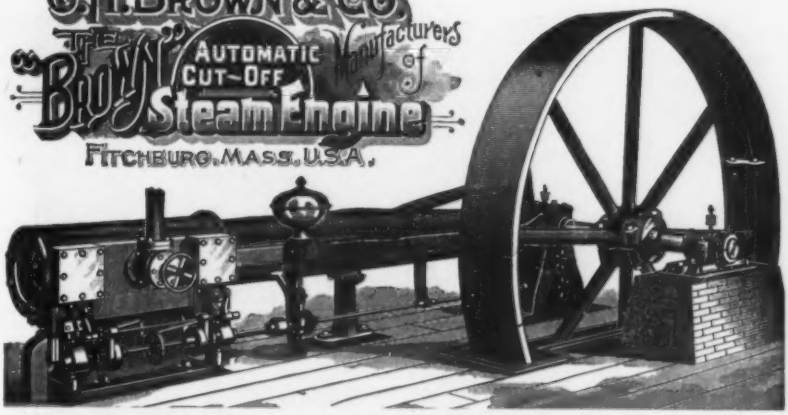

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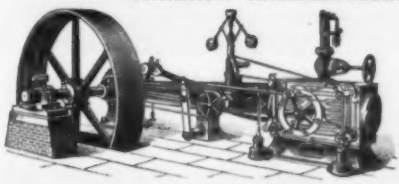

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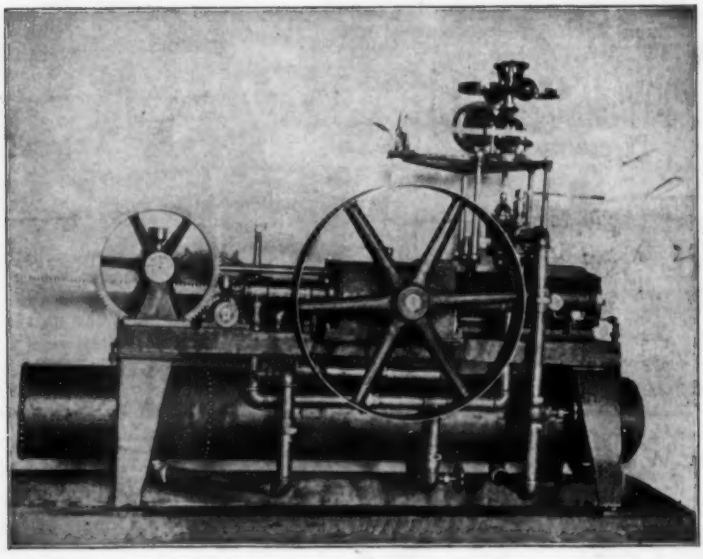

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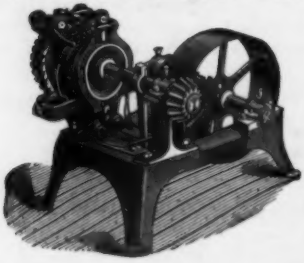

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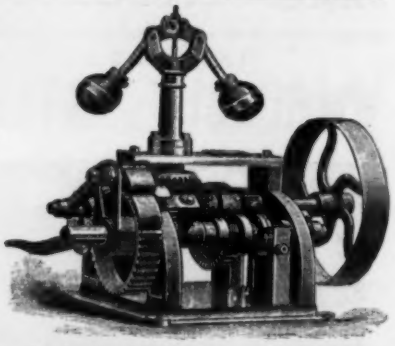

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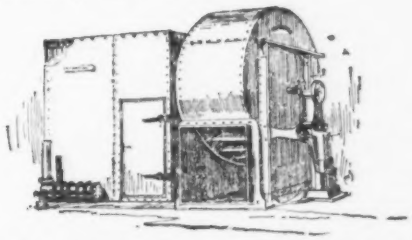

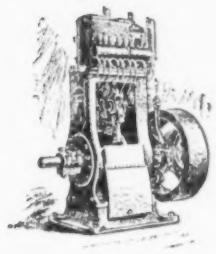

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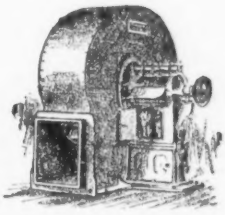

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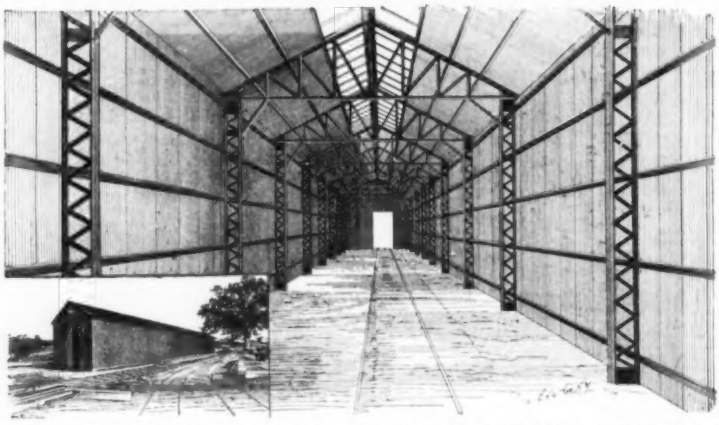

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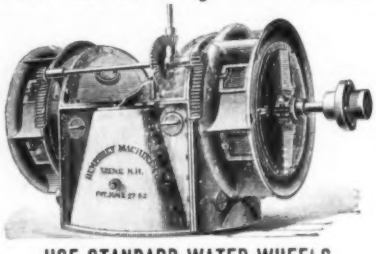

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